Volume 93 Number 21

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION • PROCESSING • DISTRIBUTION • USE

The Week in Perspective

THROUGH vigorous espousal of the cause of rugged individualism, as exemplified by great American industrialists since the days of the Revolutionary war, a prominent Detroit steel founder rallies industry to a defense (p. 14) against such allegedly socialistic measures as NRA and other trump cards in the "New Deal." He declares the industrial recovery act to be "conceived on erroneous principles, neglecting alike the teachings of history and psychology"; and alleges that a "supine and subservient congress turned the entire country into a laboratory, and its inhabitants into guinea pigs, that the professors might demonstrate upon them the success or failure of their theories."

Blue Eagle's Claws Need Regrinding?

Meanwhile, NRA continues its checkered and codified career. Steel executives, pleased with their industry's code, ask (p. 10) for its extension until May 31. General Johnson, blue eagle chief, returning from an expedition through reputed troublous territory, finds the NRA doing nicely but suffering (p. 16) from nonenforcement. Returning to Washington, he discovers attention for the moment has veered to monetary problems and recognition of Russia. With the latter (p. 12) out of the way, markets are expected to open (p. 16) in the soviet for 3,000,000 tons of rails, which, in addition to the recently arranged government-financed domestic tonnage, should blow some dust off the country's rail mills. Russia also is reported (p. 57) to have a feeler out in the Pittsbugh district for 20,000 tons of oil line pipe.

Business in Contraseasonal Turnabout

Devaluing of the dollar, in process for the past several weeks, is seen by some economists (p. 15) as stimulating the steel business, as an outgrowth of the desire to convert currency to commodities. Possibly justifying this opinion, the national operating rate (p. 11) has climbed 4 points to 28 per cent and markets in general (p. 47) have a more favorable tone, in spite of the usual seasonal deceleration experienced in November. . . . Contributing to a higher steelmaking rate, one blast furnace and four openhearths have been lighted (p. 17) at the Ford plant in Detroit. . . . Under new leadership, a more aggressive merchandising and a more closely-co-ordinated program of model refinements are expected (p. 17) from General Motors Corp. in the coming year.

Rule Against Dumping of Foreign Products

Today is the first day (p. 10) prices on steel products may be filed for first-quarter contracts. General opinion is against any increases. . . . Price increases on certain steel products in continental Europe are reported to have stimulated (p. 62) export trade, especially with China. . . . Complaints against dumping of steel by certain foreign countries have been denied (p. 11) by the treasury department, in answer to petitions filed about a year and a half ago. . . . The "conservative crowd" in the treasury department has evacuated, leaving "the professors" in control. . . . This week is election week (p. 11) in the "captive" coal mines, laborers choosing representatives to bargain with employers.

No Slump in New Materials and Methods

Lightness, strength, economy and decorative appeal are cards appearing in the "new deal" hand for die castings, made possible (p. 23) by development of improved casting alloys and perfection of casting machines and intricate dies. . . . Rolling and forging actions are combined in a new machine for rapid production (p. 26) of round steel parts, concentric throughout their axial length, as well as blanks later to be forged into irregular shapes. . . . Not in itself a particularly flexible material, steel provides a flexible form of construction (p. 34) for a newly designed type of service station, with interior and exterior of enameled steel panels, bolted together. . . . Forming processes can be segregated (p. 28) into those involving direct pressure and those involving indirect pressure, if classified according to force effects.

Ask Steel Code Extension to May 31; News of the Week

AMERICAN Iron and Steel institute Friday transmitted to NRA Administrator Johnson in Washington a resolution, adopted unanimously, expressing its general satisfaction with the operation of the iron and steel code and proposing an extension of the code until May 31.

In its resolution the Institute submitted a detailed report on its operations since the code was signed by the President Aug. 19, especially in regard to increased employment and payrolls.

The resolution was submitted to the President Friday morning by General Johnson. Late Friday the President said the resolution was important in showing one of the big industries is for the code system.

Although it has been generally stated that the iron and steel code expired Nov. 19, strictly speaking the 90-day trial period, dating from the signing of the code by the President, expired Friday, Nov. 17, this being the lapse of 90 calendar days.

Section 2 of article XII of the code provides that it shall be extended unless signatories to the code or the President exercise their right of termination or amendment. The President was expected to accept the extension to May 1.

¶Meeting Tuesday and Wednesday of last week, directors of the Institute considered a number of additional commercial resolutions, probably to be announced this week.

¶Commercial resolution No. 30 made effective Nov. 3 relates to the payment of invoices.

¶The Institute has issued an explanation of paragraph E, section 1 of commercial resolution No. 8 as amended Oct. 27, relating to the method of determining whether carload or less carload prices and billings shall apply on shipments trucked by the customer and for his account.

¶Monday, Nov. 20, is the first date on which iron and steel prices for first quarter of 1934 may be filed, permitting bookings beginning Dec. 1. It was expected in New York Friday that boiler tubes, nails and possibly billets would be among the relatively few products likely to be advanced soon.

Codes

FLAT sheets will be excluded from the NRA wholesale code and included in the code for the American Steel Warehousing association if protests lodged at the Nov. 13 hearing on the wholesale code are approved.

B. F. McCreary, chairman of the Flat Sheet Steel association, spoke for 65 companies objecting to inclusion in the wholesale code. H. B. Ressler, chairman of the sheet steel committee of the Warehousing association, spoke similarly on behalf of the association, composed of 177 members who sold 100,000 tons from warehouse stocks last year. Nonmember companies also opposing the wholesale code distributed 63,590 tons.

The National Association of Sheet Metal Distributors, favoring provisions in the wholesale code, claimed 231 members and $100,000,000 of the industry's total annual sales of $125,000,000.

¶Presenting the gray iron foundry industry code recently, Walter L. Seelbach, Forest City Foundries, Cleveland, chairman of the steering committee, gave the scope of the industry as 1600 jobbing foundries with 71,000 employes at present, a maximum of 99,000 employes in 1929, a potential capacity of $195,000,000 annual business, and present volume less than $73,000,000.

C. B. Magrath, Chicago, amended the definition of the industry, making it one manufacturing gray iron jobbing castings; the exception of specialties, especially cooking and heating appliances, carwheels and locomotive parts was affirmed by the gray iron committee. A group of automotive gray iron castings producers asked to be included under the code.

Labor provisions offer a 40-hour week with a minimum hourly rate in the southern district of 25 cents and in the north from 37 to 40 cents.

¶Almost first to recognize the importance of a labor board, the Foundry Equipment Manufacturers' association in submitting its code offered a provision setting up a joint committee with equal representation of employer and employe members and an impartial chairman to investigate complaints on labor provisions and report to the code authority of the industry. The code provides a basic 40-hour week and an hourly minimum of 40 cents.

¶Code hearings announced: For the scrap iron, nonferrous scrap metals and waste materials trade, Nov. 22; Diesel engine manufacturing industry, Nov. 22; conveyor and material preparation equipment manufacturers industry, Nov. 24; metal lath industry postponed from Nov. 23 to Dec. 4.

¶Dr. Alexander Sachs, chairman of the research and planning commission of NRA and loaned to NRA by Lehman Bros., New York, has resigned.

¶An eastern iron and steel company, believing there has been too much selling of the iron and steel code and not enough of iron and steel itself, recently issued instructions to

STEEL fortresses erected in Indiana county jails following epidemic of prison breaks and mob attacks. This unit in the Marion county jail at Indianapolis is constructed of 3/8-inch plate; is bullet proof and has eight slots for machine guns; cost, $1000

Wide World Photo

its salesmen not to attempt to interpret the code or to call up the home office for interpretations. Letters to the home office are permissible, but attention of the sales staff is directed to the explicit instructions issued by the home office concerning terms, extras, etc., which instructions do not mention codes. Since clamping the lid on interpretations, the company's business has improved.

Dumping

SEVENTEEN months after the complaint was filed, the treasury department last week found that steel products were not dumped from France, Germany and the Saar Basin.

When the American Iron and Steel institute complained June 3, 1932, that angles, bars, beams, billets, channels, plates, sheets—in fact, all finished products—were being dumped by these countries it followed up the charge lodged in May, 1932, that hoops were being dumped by England, France, Belgium and Holland.

Hearings were held during the late fall of 1932, but no official action was taken until last week.

Previously the treasury had ruled that there was no dumping of pig iron from certain European nations, so the records of the customs bureau of the treasury department are now practically cleared of dumping matters.

Identical orders were issued in all cases, the secretary simply stating that "after an extensive investigation and careful consideration of the evidence gathered, I have reached the conclusion that a finding of dumping with respect to certain steel products * * * is not justified and must decline to issue such finding."

These orders by Secretary Woodin and Assistant Secretary Acheson were practically their last official acts before stepping down.

Production

STEELMAKING operations in the week ended Nov. 18 lifted 4 points to 28 per cent, recouping all of the recession thus far in November.

Buffalo, advancing 11 points to 32 per cent last week as steelworks received rush orders, led the rise. Twelve open hearths were active last week, all tentatively scheduled to continue this week.

Youngstown unexpectedly increased 10 points to 31 per cent, with 29 out of 83 open hearths melting, with an average close to 30 per cent expected for this week.

Wheeling mills went up 8 points to 46 per cent, when three open hearths in one plant resumed. With Ford lighting four open hearths and Great Lakes continuing with three, the Detroit rate also advanced 8 points, to 45 per cent.

Pittsburgh mills operated at 21 per cent last week, a decline of 2 points, but were expected to recoup 1 if not 2 points by the end of this week. A leading interest at Pittsburgh operated at 23 per cent last week, but independents brought the average down. Chicago held at 29 per cent, with 9 steel stacks on.

Cleveland-Lorain district held unchanged at 46 per cent, with Birmingham also unchanged at 20 per cent. The central eastern seaboard district was off 1 point to 17½ per cent, with little variation scheduled this week. New England ingot operations were at 70 per cent, down 5, with indications that this rate will hold this week.

The American Iron and Steel institute forecast for last week was 27.1 per cent.

¶Algoma Steel Corp., Sault Ste. Marie, Ont., will resume operation of its rail mill Dec. 4, increasing its employes from 500 to 1500. It lighted the No. 4 blast furnace and five open-hearth furnaces on Nov. 15, and will light 50 more coke ovens shortly.

¶Furnaces of the Dayton Coal, Iron & Railway Co., Dayton, Tenn., purchased in 1917 from W. B. Allen, receiver for the Dayton Coal & Iron Co., are being torn down. The two stacks, built in 1884-5 by English capital and having an annual capacity of 125,000 tons of foundry iron, have been inactive many years.

Transportation

RAILROAD CO-ORDINATOR EASTMAN will not attempt to allocate rails and track fastenings purchased by the railroads by the aid of PWA loans, thus averting a threatened disturbance of rail mill and railroad relationships.

¶Appointment of a committee of railroad mechanical and accounting officers to co-operate in a study of freight car pooling is announced by Mr. Eastman.

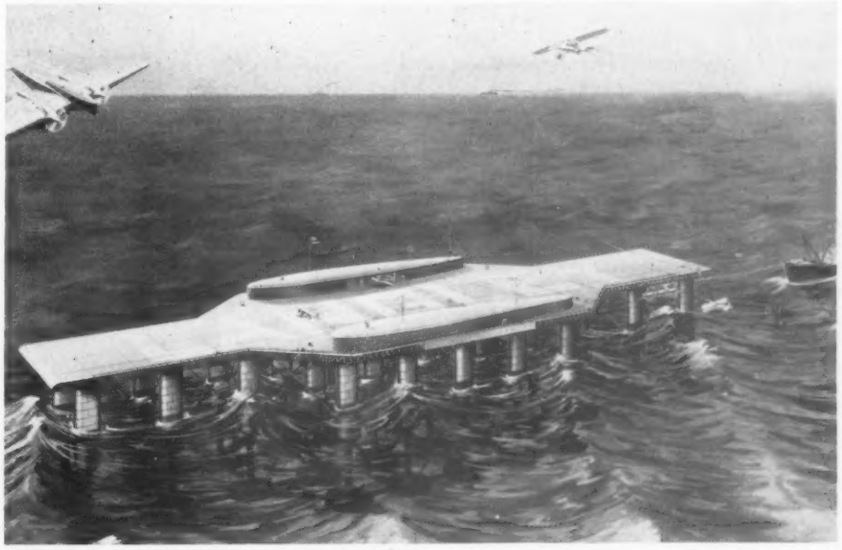
¶A questionnaire on locomotives, possibly leading to purchasing through government aid, has been distributed by Mr. Eastman.

¶A definite decision against government purchasing or financing of freight cars has been reached.

Labor

THIS week has been designated for elections at "captive" coal mines in western Pennsylvania of iron and steel producers in accordance with the agreement recently reached between the industry and the President. Instructions for the conduct of these elections have been issued by the national labor board in Washington.

Nominations were received by two



PWA LOANS $1,500,000 *FOR FLOATING AIRPORT: Funds have been allocated to the aeronautics branch of the department of commerce for starting work on a demonstration section (one-fourth of full length) of this seadrome,* (STEEL, *Feb.* 15, 1932, *p.* 28) *developed and pioneered by Edwin R. Armstrong, consulting mechanical engineer. If tests on the demonstration section are successful, the first full-size unit will be built and anchored about* 500 *miles off the coast of Norfolk, Va. Original seadrome plans called for the use of about* 17,000 *tons of iron and steel, chiefly structural variety, in the construction of a single unit, cost of which is estimated to be about* $6,000,000. *It is ultimately projected to locate the landing fields along a southerly Atlantic air route to Europe, all to be owned, established and operated by the federal government*

representatives of the board until noon, Nov. 20, in Pittsburgh. These nominations will be printed on ballots and distributed among 15,000 miners in Fayette, Allegheny, Washington and Greene counties.

Mine owners will receive and deal with the elected representatives from their various mines, but they will treat with these representatives as spokesmen for the labor at these mines and not as representatives of any union organization.

These steel companies operate mines at which elections will be held: United States Steel Corp., Allegheny Steel Co., Inland Steel Co., Republic Steel Corp., National Steel Corp., Jones & Laughlin Steel Corp., and Crucible Steel Co. of America.

¶Through another winter, iron ore mines in the Lake Superior district will be operated to provide employment, over 3000 miners being returned to work shortly.

Cleveland-Cliffs Iron Co. will resume with 1600 men. Jones & Laughlin Steel Corp. is unwatering its Grant mine, idle for 13 years, will start stripping its Hill Annex mine, and will resume operations at its Lincoln mine.

The Corrigan, McKinney Steel Co. Nov. 6 reopened its Odgers-Genesee and Tobin mines. Pickands, Mather & Co. last week put 1200 men back on its payrolls in Minnesota and Michigan. Republic Steel Corp. is continuing its Cambria-Hartford mine on a five-day week basis, with 200 men.

¶Colorado Fuel & Iron Co., long noted for its Rockefeller plan of industrial representation, expects to treat with representatives of the United Mine Workers of America, which is unionizing its coal properties, but the Rockefeller plan is being continued in other departments. Its miners voted 877 to 273 to affiliate with the United Mine Workers.

¶On the streets of almost every large city last winter unemployed men offered two articles for sale—apples and foreign-made rules. Last month Judge M. B. Campbell, of the United States district court for the eastern district of New York, handed down an opinion in the case of Hiram A. Farrand Inc. and the Stanley Works, New Britain, Conn., sustaining the four patents on collable rules of Mr. Farrand, which were in issue in this case. The probable result is that if any rules are offered on the streets this winter they will be American made and provide work for American employes.

¶Businessmen of Elwood, Ind., and employes of the American Sheet & Tin Plate Co. there are so pleased at the manner in which the Elwood plant has been operating the past few months that they are arranging a celebration. Head officials of the company at Pittsburgh will be invited and the date fixed for their convenience.

¶An insurance company is pointing out that the hiring of additional employes to aid recovery may increase accidents among new workers and that proper workmens' compensation and employers liability coverage are highly desirable.

¶National Metal Trades association reports employment in the metal trades in October the highest in two years, being 65.3 per cent of the 1925-27 monthly average. October saw gains in Boston, Philadelphia, Cincinnati and the Tri-Cities, decreases in Detroit, Indianapolis, Cleveland and Chicago.

Color, an Aid to Employe Morale and Plant Upkeep

PROPER use of color acts as a definite physical and mental aid to factory and plant workers.

"With light walls making for more efficient worker vision, colored machinery and equipment fit perfectly into the modern conception of a steel production unit," according to Luther Becker, chief of the iron and steel division, department of commerce, Washington.

A number of definite results have been obtained with color experiments in leading industrial plants throughout the country—not only in the painting of the interiors of the structures themselves, but also in the painting of machines used for different purposes.

Gifford Simonds, vice president and general manager, Simonds Saw & Steel Co., has found that his operators work faster and more efficiently on orange colored machines. This applies to heavy as well as to light work. A. D. Engle, Austin Co. engineer, lists the proper use of color as one of the eight points which make the "controlled conditions" plant the dominant factor in increased production and in greater working life of operators.

In all manufacturing units there are certain production assets, it is pointed out, whose merits are just beginning to receive due consideration. Lighting, even though its values are obvious, is one. Air conditioning, temperature control, the possibilities of windowless buildings and sound control are others.

Experts carrying on these experiments say that color must now be added to the list—color for the plant, its machinery and equipment. The right choice of light and contrasting background is said to be a definite determining factor in creating an improved mental and psychological condition that means much in worker morale. Further, depreciation is retarded.

Russia

FORMAL recognition of Russia, granted Nov. 17, is expected to open the way to resumption of trading, although this will be largely contingent upon financing.

As noted on page 16 of this issue, where also are given data on American-Russian trade since 1920, unverified reports refer to the prospective purchase of a large tonnage of rails.

While officials of the Amtorg Trading Corp., New York, Russia's trading agents in this country, have been silent, there have been rumors that future orders might include $100,000,000 of railroad equipment, $400,000,000 of machinery and $200,000,000 of ferrous metals.

Prof. Kenneth H. Donaldson, of Case School of Applied Science, Cleveland, proposing that the United States accept raw materials in payment for manufactures, visualizes Russia as a market for 13,000 freight cars, 250 locomotives, 200,000 tons each of pipe, sheets, plates and shapes, 400,000 tons of rails, airplanes and automobiles costing $35,000,000, machinery to a total of $90,000,000, hand tools costing $12,000,000 and household equipment (largely metal) $13,000,000.

One direct effect of recognition to manufacturers of patented equipment is the honoring of patents. In pre-recogniton days there was no restraining influence upon Russian engineers from building and operating certain patented American steelmaking or fabricating equipment. Now, the validity of American patents will be subject to negotiations.

Financial

GRANITE CITY STEEL CO., Granite City, Ill., reports third quarter profit of $202,857, after charges, compared with profit of $111,179 in the second quarter and $19,906 in the third quarter of 1932. Profit for nine months, after charges, is $233,611, against $9072 a year ago.

¶McKeesport Tin Plate Co., McKeesport, Pa., has voted its regular $1 quarterly dividend, payable Jan. 2 to Dec. 15 record.

¶Dominion Steel & Coal Corp. has called a special meeting at Toronto, Ont., Dec. 11 to consider plans for postponement of interest payments on its bonds from March 1, 1933, to Sept. 1, 1935.

¶Ludlum Steel Co. stockholders were voting at Pompton Lakes, N. J., Nov. 20, on a proposal that holders of preferred stock waive the

payment of $19.50 in accumulated dividends in return for the sum of $1 per share and the right to convert one share of preferred into five shares of common stock.

¶John A. MacPhail has been appointed receiver for the Algoma Steel Corp., Sault Ste. Marie, Ont., succeeding Alex Taylor, who resigned several months ago. Sir William Stavert, of Montreal, Que., and W. C. Franz, of Sault Ste. Marie, will continue as co-receivers.

News Oddities

STEEL scrap in the Pittsburgh district has been applied on an export order for Japan, according to reliable trade information at Pittsburgh. Made up of about 2000 tons of baled tin cans originating in the plant of the Alleghany Garbage Co., Herrs Island, Pittsburgh, the scrap is understood to have been sold at that point recently for $2 a ton.

Shipments are going overland to the eastern coast, thence by water to Japan. Ordinarily, Pittsburgh steel mills are reluctant to take baled tin cans for melting. This is believed to be the first time scrap originating in Pittsburgh has been shipped on export.

¶Dentists, in convention at Pittsburgh Nov. 14, recommended the use of stainless steel for fillings if the price of gold goes much higher.

¶Gold is stimulating demand for steel. The use of steel I-beams for bracing the 5-compartment shaft of the Phelps-Dodge Corp's Junction mine near Bisbee, Ariz., is reported as a new development in the gold mining country. Nothing but steel is being used in the 10 x 30-foot shaft, which is being driven from the 2350 foot level to the 2800 foot level.

¶When the Crab Apple mill of the Eagle Picher Lead Co., near Picher, Okla., burned recently, a mule was found trapped in a narrow trench. To rescue it, part of the trench was blown away—and a new vein of lead ore discovered. The mule was unharmed.

Canada

BRITISH efforts to buy the Objibway, Ont., plant of the Canadian Steel Corp., subsidiary of the United States Steel Corp., having proved unsuccessful, it was announced in Toronto, Ont., last week that a tin plate plant will be established at Sarnia, Ont. This would continue to make section 383B of the Canadian customs tariff operative. A hindrance will be placed against British tin plate, but only one-fourth the duty that would be assessed on imports from the United States.

Foundrymen Urge Revision of Unsound National Policies

EARLY, drastic modification of certain policies of the government administration's recovery program was proposed in emphatic terms by speakers at the thirty-seventh annual convention of the National Founders association, Waldorf-Astoria hotel, New York, Nov. 15 and 16.

The concensus of sentiment among the more than 200 members present —the largest attendance in several years—was embodied in two resolutions, which were adopted unanimously. The first affirmed the support of NIRA by the association insofar as it affected hours, wages and conditions of employment, recognizing the measure as a temporary procedure, an emergency act to be discontinued at the end of the emergency period. The second placed the association on record as in favor of a sound currency based on gold.

These resolutions were the culmination of a program of noteworthy addresses on methods for promoting national recovery. The keynote was struck in a masterly analysis of administration policies by S. Wells Utley, president of the National Founders association. His address is summarized on page 14.

Dr. Virgil Jordan, president, National Industrial Conference board, also scored present tendencies in recovery administration. Suggesting that the President's policies constitute the "new delusion," rather than the "new deal," he proposed that the government reverse its policies in four directions in order to head off destructive inflation and the assumption of an absolute dictatorship.

Proposed Changes in Policy

Among his proposals are:

1. Cease immediately efforts to raise the price level by deliberate depreciation of the dollar; use other methods to raise prices to the point desired; do not permit prices to exceed this point; announce that before Jan. 1 "it is the firm intention of the administration to restore the gold standard. . . ."

2. The administration should announce that the main emphasis henceforth will be put upon speeding up the normal processes of recovery through encouragement of private enterprise, particularly in the construction and fixed capital investment fields; that problems of reform are long-time problems which cannot be solved immediately.

3. Suspend the blanket code immediately; reorganize NRA and AGRA so as to facilitate approval of industrial codes with respect solely to their wage and hour provisions, and of agricultural agreements with respect to price provisions.

4. Reorganize the national labor board so as to make the representation of employers upon it more adequate and effective.

A. E. McClintock, commissioner of N.F.A., reported that despite strikes and labor diciculties throughout industry generally, none of the members of the association has been involved in strikes within the past year.

Gilbert H. Montague, New York lawyer and member of Secretary Roper's business and advisory and planning council's sub-committee on unfair trade practices, discussed code-making policies of NRA. Two interesting papers dealing with dust control and the legal aspects of dust hazard in the foundry industry were presented by E. O. Jones, consultant, National Founders' association, and Alfred C. Hirth, attorney, Toledo, O.

Elect Pangborn President

Thomas W. Pangborn, Pangborn Corp., Hagerstown, Md., was unanimously chosen as president for the succeeding year. Other officers elected included F. H. Clausen, Van Brunt Mfg. Co., Horicon, Wis., vice president; and J. M. Taylor, Chicago, secretary and treasurer. S. Wells Utley was elected honorary member of the administrative council.

District committees were elected as follows:

First District

Walter Abbe Jr., Smith & Winchester Mfg. Co., South Windham, Conn.; Franklin R. Hoadley, Farrel-Birmingham Co. Inc., Ansonia, Conn.; E. H. Ballard, General Electric Co., West Lynn, Mass.; A. W. Calder Jr., New England Butt Co., Providence, R. I.; A. B. Root Jr., Hunt-Spiller Mfg. Corp., Boston.

Second District

William Lonsdale, Foster-Wheeler Corp., Carteret, N. J.; J. L. Lonergan, Morris Machine Works, Baldwinsville, N. Y.; Roger Williams, Richardson & Boynton Co., New York; V. C. Kreuter, American Laundry Machinery Co., Rochester, N. Y.; W. W. Bates, Delaware & Hudson Co., Albany, N. Y.

Third District

S. F. Workman, Frick Co., Waynesboro, Pa.; William L. Litle, Bucyrus-Erie Co., Erie, Pa.; George T. Ladd, United Engineering & Foundry Co., Pittsburgh; H. W. Johnson, De Laval Steam Turbine Co., Trenton, N. J.; W. S. Shipley, York Ice Machinery Corp., York, Pa.

Fourth District

L. H. Link, Bass Foundry & Ma-

chine Co., Fort Wayne, Ind.; Ralph H. West, West Steel Casting Co., Cleveland, O.; William B. Cullen, Miami Foundry Co., Miamsburg, O.; George Seyler, Lunkenheimer Co., Cincinnati, O.; Fred Erb, Eaton-Erb Foundry Co., Detroit.

Fifth District

W. F. Heesch, French & Hecht Inc., Davenport, Iowa; John B. Strauch, National Bearing Metals Corp., St. Louis, Mo.; A. H. Head, John Deere Tractor Co., Waterloo, Iowa; George P. Torrence, Link Belt Co., Chicago; H. G. Myers, Gardner-Denver Co., Quincy, Ill.

Sixth District

Clarence R. Falk, Falk Corp., Milwaukee; Curry S. Prescott, Prescott Co., Menominee, Mich.; John M. Brawley, South Park Foundry & Machine Co., South St. Paul, Minn.; Walter Harnischfeger, Harnischfeger Corp., Milwaukee; R. A. Peterson, Valley Iron Works, Appleton, Wis.

Seventh District

W. C. Trout, Lufkin Foundry & Machine Co., Lufkin, Texas; C. P. Caldwell, Caldwell Foundry & Machine Co., Birmingham, Ala.; H. A. McLellan, General Fire Extinguisher Co., Atlanta, Ga.; R. C. Stobert, Hardie-Tynes Mfg. Co., Birmingham, Ala.; H. E. McWane, Lynchburg Foundry Co., Lynchburg, Va.

'New Deal' or 'New Delusion'?

BY S. WELLS UTLEY

WHAT is the fundamental philosophy underlying the thought of those who today control our government and are rapidly translating this philosophy into the law of the land? They have been repeatedly stated and affirmed, both by the President and his closest associates. Briefly, they are:

1.—That the depression is the direct fault of industry and business, through the maldistribution of income and wealth.

2.—That too large a part of the national income is invested in wealth-producing capital goods, thereby causing an over-production of consumer goods, on the one hand, and an insufficient purchasing of consumer goods, on the other.

3.—That too much of the national income goes to those who have a surplus over the bare cost of living, and who can therefore invest it, and too little goes to those dependent on wages and salaries.

4—That too much of the national income goes to the industrial workers in the cities, and too little goes to the farmers.

5.—That the way out of this depression is not to create more wealth, but rather to redistribute what we have, by taking it away from those who have been able and thrifty.

The most important of the amazing acts of legislation which exemplify this interpretation of the "New Deal" are: The banking and currency acts; the security act; the farm mortgage laws; the Tennessee valley act, characterized by Norman Thomas as the purest example of socialism ever enacted in this country; the new railway act; the agricultural adjustment act; and the national recovery act, originally called the national industrial control act.

Perhaps NIRA most clearly brings into view the changes which have taken place in some of our fundamental institutions. This act provides that the members of an industry may prepare a code of fair competition (note it doesn't say they *must* prepare such a code), which the President may approve, and which thereupon becomes a part of the law.

The act has two purposes: The immediate one to stimulate recovery by decreasing unemployment and increasing purchasing power; and the ultimate one, to reconstruct the industrial structure by turning the control of industry over to the federal government, on the theory that through state socialism the bureaucracy of the government is better able to plan or direct or dictate the operation of industry, than are the men who have devoted their lives to that work.

There is no one in industry who does not subscribe wholeheartedly to the desire to increase employment, to put men back to work, to alleviate the suffering, both mental and physical, caused by the depression. Management has had no task that has been so hard, no problem which has caused so many sleepless nights, as has the necessity of cutting down forces and laying off faithful employes, and no one would welcome with gladder heart the restoration of full time, full forces, and full payrolls than would the management of industry.

Methods Is Questionable

But, however much we may agree with the objective, we cannot feel that the method of accomplishing it attempted by this law ever had the slightest chance of succeeding. Conceived on erroneous principles, neglecting alike the teachings of history and psychology, it couldn't possibly succeed, and the best that could be said for it was to express the pious hope that it would not leave us in a worse condition than it found us. For—if by raising minimum wages a little we can produce a little prosperity, then by raising them more we can produce a greater prosperity, and the only limit to our prosperity is the size of the figure we arbitrarily set in our codes. Such a doctrine, pushed to its logical conclusion, means universal bankruptcy and starvation.

An examination of income tax returns from manufacturing industry alone shows that in 1931, 270,000 institutions, out of 440,000 reporting, showed an actual loss in excess of 6 billion dollars; so that, bearing in mind the increasing severity of the depression, it is a safe assertion that in the two and a half years immediately preceding the passage of this law the manufacturing industries alone had a dead loss of between 15 and 20 billion dollars, an actual loss almost equivalent to the then existing national debt. There is no reason to think that these losses were not approximated by other lines of industry, and, in the light of these figures, there can be no possible justification for the idea that there is a pot of gold from which bigger wages may be paid.

But, even if the foregoing had not been true, the scheme could not have obtained the results sought. It is obvious that the sudden increase in purchasing power will at best produce a corresponding increase in volume of purchases only in the case of consumer goods. Its effect on the purchase of capital goods must be slow and long-delayed. But unemployment is largely in the capital goods industry. At the low point of the depression, the employment in consumer goods industries showed a decrease of 28.9 per cent under the figures for 1929; whereas, at the same point, employment in capital goods industries showed a decrease of 68.2 per cent, almost two and a half times that of consumer goods. If consumer goods industries should snap back to 100 per cent it would have a relatively small effect on the total unemployment situation, because that is largely dependent upon the condition of the capital goods industries.

So long as the gentlemen who sponsor this revolution hold that too much of society's income is going into the production of new wealth, and that this trend must be reversed; so long as they continue to prevent the flow of wealth into capital goods, by the security act, and other methods repeatedly suggested by the President and his advisers, there seems little immediate prospect of reviving the capital goods industries, and no immediate prospect of any great decrease in unemployment. The inescapable effect of this law if it continues on the statute books for the 19 months it has yet to run will be the gradual closing of industries in the smaller towns, the gradual closing of the smaller units in all towns, the survival only of those units which are favored by particular circumstances or

(*Please turn to Page* 59)

From an address delivered at the thirty-seventh annual meeting of the National Founders association, New York, Nov. 15.

WINDOWS OF WASHINGTON

See Inflation Aiding Steel

• • •

Russia a Big Rail Buyer?

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Labor Is Still Plaguing NRA

WASHINGTON

INFLATION, purchase of gold, recognition of Russia, reorganization of NRA and perhaps its coordination with other business supervisory bodies of the government, distribution of a billion dollars this winter by work and relief agencies and release of another billion now frozen in closed banks—what does all this mean to steel?

Obviously, the objective of the President is to increase employment. Whether this is profitable or profitless to industry is beside the point of stimulating activity to create jobs. These moves by the government follow no basic pattern—they are projected as spearheads to establish advances on as many business fronts as possible, but all are affected with some interest to steel.

Like all industry, steel has been the butt recently of much uncertainty on the part of ultimate consumers, as reflected by the almost unbroken decline in steelmaking operations since late July. But by the end of last week the general ebb in production and the rising tide of protest against obscurity over the government's program had reached such proportions as to compel Washington to begin taking the country into its confidence.

WHETHER the administration swings further to the left or veers to the right in its monetary policies is dependent, of course, upon the viewpoint, but Washington sees immediate benefits to steel. It visualizes at least the possibility of brisk contracting if not also a substantial increase in production before the turn of the year.

This is the way, briefly, that Washington relates its monetary policies to steel:

The logical outcome of inflation is to create distrust of money and to instigate a retreat from money to real wealth, or commodities. In fact, inflation will not "work" unless it destroys confidence in currency and spurs its conversion into commodities.

The process of buying gold can also be described as one of selling dollars. Hence the more money pushed out, both at home and abroad, in return for gold, the more money available for commodities.

As the value of the dollar falls in relation to foreign exchange, American commodities become lower priced in world markets and foreign trade, at least theoretically, should be stimulated.

Stabilization of the dollar and prohibition of further exports of capital will tend to give business a definite yardstick again for measuring values and will confront owners of capital with the decision to hoard funds or invest them in industry or in commodities.

So, as Washington views it, the situation is rapidly shaping itself up to make it attractive for consumers to make investments in inventories and producers of materials comprising these inventories to put in stocks of raw materials.

A highly-placed economist in the government service, asked last week if he were a manufacturer would he prefer an inventory to money in the bank, said yes.

THE departure of Woodin and Acheson from the treasury last week and the selection of Morgenthau as the acting head of the treasury places the government machinery in hands favorable to the President but by no means entirely stills the reservations entertained in Washington concerning inflation.

Woodin and Acheson, incidentally, were the rallying points of what has been referred to in this department frequently as the "conservative treasury crowd." This crowd came into power for a brief period after the "brain trust" was overthrown and before "the professors" surrounded the President.

A man in Washington who has access to the administration's thinking thus describes the reason why Professor Warren, originator of the present policy on gold, has such influence:

In the first place, Professor Warren did a good job in advising Mr. Roosevelt on banking policies when the latter was governor of New York.

In the second place, the President has a distrust of what might be termed the orthodox mind. In medicine, as he sees it, any doctor or surgeon proposing a radically-different method of treatment is immediately branded a quack and placed outside of the pale, hence all advances may be considered as coming from the outside

Likewise in economics. When a new idea, such as the Warren theory of the relation of gold to commodity prices, is promulgated, orthodox economy is swift to condemn and reject it. To the President's mind, however, this is sufficient to cloak it with merit. So the President is disposed to give the Warren theory a trial, hoping thereby to be blazing a new trail in economics.

A government official who is unconvinced by the Warren theory suggests this possible reaction by the public: By its hesitation the public evidences its lack of confidence in the soundness of the President's program, at the same time also lacking sufficient confidence in its unsoundness to go out and convert its money into commodities, as the program intends.

SUCH things do happen, of course, but it is not at all likely that J. Pierpont Morgan and Myron C. Taylor came all the way from New

York last Thursday for a cup of tea at the White House. It is more likely that business was discussed, possibly the extent to which the financial community and steel would go in financing business with Russia.

No one in Washington minces words about unlimited possibilities for trade with the soviets if 3 to 5 year credits are granted. These credits could take the form of an outright advance by the RFC to the Amtorg Trading Corp. or some other soviet agency, or approved private arrangements insured by the RFC.

It should not be forgotten that the President regards steel as a "key" industry—his efforts to get some rail business for it proves that, and steel is greatly desired by Russia.

Unverified reports have it that Russia will buy up to 3,000,000 tons of rails in this market, if financed. Since export business is priced no higher than domestic, and usually lower, the President's recently-fixed price of $36.37½ on standard rails may also apply to Russian business. With the capacity of United States rail mills estimated at about 4,000,000 tons, this Russian business plus pending domestic orders brighten the outlook for rails.

Up to the time of the depression the United States Steel Corp. is understood to have had a small revolving fund for financing Russian purchases, but this was discontinued by a former president.

As a gage of Russian business, the soviets in 1932 purchased in outside markets a total of $257,000,000 of industrial, agricultural and automotive machinery and equipment. Soviet imports of iron and steel totaled 974,000 metric tons in 1932 and 1,570,000 tons in 1931.

Russian production in 1932 was 6,200,000 tons of pig iron, 5,900,000 tons of steel ingots and 4,200,000 tons of rolled steel products. The comparison for 1931 is 4,900,000 tons of pig iron, 5,300,000 tons of ingots and 4,000,000 tons of rolled products.

In dollars, for all commodities, trade of the United States with Russia in recent years has been:

Year	Imports	Exports
1920	$12,480,586	$28,727,718
1921	1,043,260	15,540,136
1922	522,833	28,814,025
1923	1,481,699	7,308,389
1924	6,030,465	41,948,578
1925	13,119,673	68,906,060
1926	14,121,992	49,905,642
1927	12,876,790	64,921,693
1928	14,024,525	74,091,235
1929	22,555,714	84,725,205
1930	24,385,786	114,398,537
1931	13,206,393	103,668,808
1932	9,704,000	12,648,000

RUSSIA, inflation, gold and other government weapons for recovery have made NRA just another phase of the administration's program, as forecast many weeks ago. In fact, these other agencies might not have been called into play had NRA snapped business back as claimed for it.

When General Johnson returned last week from his swing through the West, where he found nothing wrong with NRA except nonenforcement, it was to an office redecorated in a cream tint, with new walnut desks for himself and his ubiquitous secretary, and red drapes at the windows.

On his desk were beautiful flowers, for which the hat had been passed among his staff, and also a few things not so lovely, including the still-moot construction industry code, the ruling of Comptroller General McCarl that Fords without the blue eagle remain a good buy for the government provided the price is right, a rapidly widening schism within NRA on code compliance, and a covetous attitude by at least three other government agencies toward NRA.

The immediate interest of industry is that through neglect to set up code authorities to handle labor matters as well as trade practices it may be an innocent victim of the growing unrest surrounding NRA.

Most industries have set up the machinery for administering all phases of their codes except labor. They can also control their own labor situations by providing boards on which employes and management will have equal representation, presided over by an impartial chairman or umpire.

Once this labor machinery has been created and it has been certified by the proper NRA official, all labor matters under the code fall within the jurisdiction of the code authority.

Until this is done, however, industry's labor problems are at the mercy of the 26 compliance boards established under the 26 district offices of the department of commerce.

Thus far, only the textile industry has not abdicated labor control to these compliance boards. Within NRA itself the growing feeling among industrialists conscripted for it is that industry is guilty of a serious omission in neglecting to assume control over its own labor.

Secretary of Commerce Roper is not at all displeased by having his district offices form compliance boards and handle labor matters. Secretary of Labor Perkins, a quiet but persistent worker, visualizes the day when her sovereignty will be extended to labor. The federal trade commission regards its setup as ideal for handling the trade practice angle of codes.

The national labor board, headed by Senator Wagner, appears to manifest an increasing independence, although making it perfectly clear that it steps into the picture only when there is an actual stoppage of work. Prior to this point code authorities or compliance boards function. There was a little tension between the labor board and General Johnson over the strikes in eastern Ford assembly plants.

Incidentally, the reason for the sudden withdrawal of the model code printed last week in STEEL was a difference of opinion over the setup for labor.

Organized labor sleeps with one eye open these nights, knowing that a reorganization of NRA will shortly be announced and recalling that General Johnson once said that "there must be government participation in and control of labor unions." The rejoinder of the federation was that "industry being machinery and money is a proper field for regulation in the service of humanity, but humanity itself is another matter."

The constitutionality of NRA is rising to plague Washington, two cases now being in the District of Columbia supreme court on their way to the United States Supreme Court. One involves the Ickes order against "hot oil" and the other the fixing of milk prices at Chicago, this being an agricultural administration matter but directly affecting the recovery act.

There is little argument in Washington that from the strictly legalistic standpoint enough holes could be shot into NRA to destroy it, but it is hoped that the Supreme Court is sufficiently in step with the times to sanction present methods for the emergency, and there is more reliance upon "judicial psychology" than the strict letter of the law.

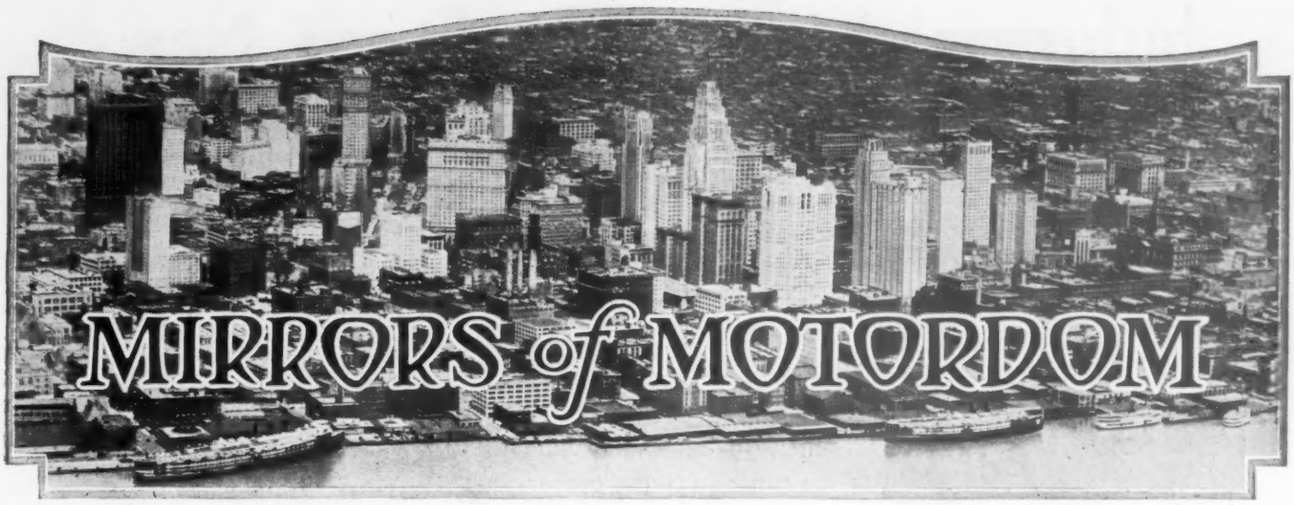
Malleable Bodies Approve Code Action, Cost Plan

Members of the Malleable Iron Research institute gave unanimous consent to continuation of activities of that organization, at a meeting in Cleveland, Nov. 15. The budget set up by the board was approved; the annual meeting for 1933 was postponed, and present officers designated to serve until the meeting.

The malleable code was discussed at a meeting of the Malleable Founders society, also held in Cleveland, Nov. 15. Means for obtaining cost information required by the code were proposed. Directors of the society are collecting information upon which to base a schedule of fair and reasonable costs

Form Colorado Mining Board

Colorado Mining Industry board was organized recently with S. A. Ionides, consulting engineer, Denver, as president. C. M. Lightburn is vice president and Robert S. Palmer, secretary of the state metal mining fund, is secretary. A state wide mining plan for Colorado is proposed, with federal aid to be requested eventually.



Knudsen Puts Fight in GMC

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Hydraulic Brakes Optional?

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Ford Tamer Without Eagle

DETROIT

EVIDENCE is accumulating that General Motors, under the spur of W. S. Knudsen, recently made vice president in charge of all automobile manufacturing of General Motors in this country, will be a more vigorous contestant for business in 1934 than in any previous year.

The leadership that has made Chevrolet and Pontiac outstanding in their fields is being applied to Olds and to Buick, and in slightly lesser degree to Cadillac-LaSalle, which are in a price range unaffected by some of the competitive conditions surrounding the low-price market.

For one thing, all General Motors cars in 1934 will have greatly increased acceleration. The economy which has been claimed for Chevrolet will also be applicable, in relation to their size and price, to the higher ranges of General Motors cars.

Hydraulic brakes, it is reported, will be offered as optional equipment this coming year on practically the entire General Motors line. Heretofore, General Motors has been the stronghold of the mechanical brake and Chrysler of the hydraulic type; the new setup is expected to meet any preference.

As previously noted, Olds will drop its six in price to sell between Chevrolet and Pontiac. All General Motors cars will show a pronounced tendency toward streamline design. It is also probable that the competition between the upper range of Buick and the lower range of LaSalle will be relieved by giving LaSalle a broader market.

Buick and Olds manufacturing operations, now in process of being divorced, are being reorganized in accordance with the Knudsen methods so successful in the case of Chevrolet and Pontiac. The Knudsen formula for making decisions in 20 minutes which formerly required some days of correspondence with New York is greatly energizing the entire General Motors organization. In his program, Mr. Knudsen is understood to have the strong backing of the Fishers.

IN EMPHASIZING its silver anniversary at the January show in New York, and continuing into 1934, General Motors will stress the role played by the iron and steel industry in the upbuilding of the automobile industry.

"Progress of the automobile industry and its contribution to social changes during the past 25 years would not have been possible without parallel development in the metallurgical industries," according to a statement by General Motors.

"The metallurgical industries are among the most important contributors. Without alloy steels, of which the automobile industry has become the largest user, the modern motor car could not provide dependable, high-speed transportation.

"But the contribution works both ways. The automobile industry is the foremost buyer of strips, bars, sheets and malleable iron as well as alloy steels.

"General Motors, as the largest produced of motor vehicles in the world, is the greatest individual consumer of automotive steels. It produces nearly half of all the cars sold to the American public and manufactures one-third of all the automobiles in the world."

The predecessor of the present corporation, the General Motors Co. of New Jersey, was formed on the basis of the Buick Motor Co. Within two years Olds, Cadillac and Oakland (now Pontiac) and a score of parts and accessory concerns were taken in.

HENRY FORD'S not having signed up for the blue eagle apparently is having the effect of making his organization lean over backward in complying with the automobile industry's code.

While no great volume has been purchased, nevertheless Ford is paying the full market price, plus full extras and differentials, on steel products placed recently, without any protesting.

The lighting of one of the two Ford blast furnaces, long idle, and of four of the ten open-hearth steel furnaces is being construed as another gesture toward co-operating with the administration and increasing employment in the Detroit area.

Unless Ford foresees a really enormous automobile market just ahead, the present volume at Fordson and the high costs of producing both pig iron and steel would not warrant resumption. Walking on eggs appears to have had a salutary effect on some Ford policies.

General Motors was scheduled to reopen the Chevrolet and Fisher Body plants at Janesville, Wis., Nov. 20, re-employing the assembly crew at the Century of Progress exhibit in Chicago . . . . Dodge has been a recent heavy purchaser of equipment, especially for its foundry . . . . Of the 340 tank trucks placed by the Gulf Refining Co., Pittsburgh, this year, 268 are steel and only 72 aluminum despite the Mellon association with Gulf and the Aluminum Co. of America. Aluminum has been used for trucks only in districts where distributors are widely separated and deadweight must be reduced . . . . A surprising amount of tool and die work has been placed the past few days with Detroit shops, considering the large volume which was transferred to outside shops when tool and die makers struck.

Industrial Men in the Day's News

Frank F. Slick, General Superintendent, Edgar Thomson Works, Carnegie Steel Co.

A native of Johnstown, Pa., he has come up through the steel industry since he was 14.

Early experience won him a position with the engineering department of the Carnegie company in 1896.

Assistant general superintendent since 1925, he now manages the Edgar Thomson works.

FRANK F. SLICK, new general superintendent of Edgar Thomson works of Carnegie Steel Co., Pittsburgh, as noted in STEEL, Oct. 16, is a man young in years with a record of continuous service with the Carnegie company that is exceeded by few.

Born in 1876 at Johnstown, Pa., he has been identified continuously with the Carnegie company since March 1, 1896. Educated in the public grade schools of Johnstown, Pa., and at Coopersdale academy, Johnstown, it was but natural that Mr. Slick early in life entered the employ of Johnstown's leading industry, the Cambria Steel Co.

Beginning in 1890 and until he was 20, Mr. Slick was employed each year during summer months in the rolling mill department of the Cambria company at various clerical and operating positions.

His experience there in the positions of rail stamper, inspector and assistant to the roller on the rail and structural mill, won for him a position in the engineering department of the Edgar Thomson works in 1896.

For the five years subsequent he was successively clerk, tracer, draftsman, and roll designer in the engineering department. From 1901 until early 1904, Mr. Slick was assistant engineer of ordnance for the Carnegie company and for part of the next year returned to the Edgar Thomson division as roll designer.

On Jan. 1, 1906, he was promoted to the superintendency of No. 3 mill there, a position which he held until 1922. Since, his advance has been rapid. Following a promotion to the operating superintendency, he was made assistant general superintendent Aug. 1, 1925, and now succeeds to the management of the plant.

Mr. Slick is a member of the American Iron and Steel institute as well as the Pittsburgh Athletic association, Edgewood Country club and Railway Club of Pittsburgh. He is a thirty-second degree Mason.

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Roger H. Clapp has been named Pacific Coast sales manager of the Wickwire Spencer Steel Co., New York, with headquarters in San Francisco. To improve service in the coast district, the company has re-established its branch office at Los Angeles, with Ben Scott in charge.

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Fred E. Bynum, formerly associated with the Gulf States Steel Co., Birmingham, Ala., is now affiliated with the St. Louis office of the Inland Steel Co., Chicago, to handle sales of the company's products in Oklahoma and Arkansas.

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Edward B. Winning has been appointed manager of northern coal mines of Republic Steel Corp., Youngstown, O., with offices in the Fayette Title & Trust building, Uniontown, Pa. He succeeds George H. Morse who is now vice president and general manager, Union Collieries Co., Pittsburgh.

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Wilbur J. Wright, who has represented the Horace G. Preston Co., manufacturer of packings, in Cleveland territory, has also taken over the Pittsburgh territory, retaining the Cleveland connection, owing to the death of E. E. Douglass in Pittsburgh.

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John E. Figner has been appointed representative in the Pittsburgh district, with headquarters at 6388 Penn avenue, for the Ex-Cell-O, Continental Tool and Krueger-Wayne Tool divisions of the Ex-Cell-O Aircraft & Tool Corp., Detroit.

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O. B. Schmeltz, formerly of the Putnam Machine Works of Manning, Maxwell & Moore Inc., Fitchburg, Mass., and more recently with the Arch Machinery Co., Pittsburgh, is now associated with Thomas M. Rees, 18 Fancourt street, Pittsburgh, in representing the Bryant Machinery & Engineering Co. in the Pittsburgh district.

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James Cleary, for several years a sales executive of the Combustion Engineering Co. Inc., New York, has been appointed manager of the Philadelphia sales district, with headquarters at 1616 Walnut street.

Fred L. Farrell has been chosen manager of the New England sales territory, with headquarters in the company's Boston office, Chamber of Commerce building.

G. O. French, previously New York

J. P. Butterfield

Who, as noted in the Oct. 16 issue of of STEEL, is in charge of the newly created stainless steel sales department of the American Rolling Mill Co., Middletown, O. He was formerly manager of the development department of the company

district sales manager of the Air Preheater Corp. and prior to that sales engineer of the Walsh & Weidner Boiler Co., has been engaged as sales engineer specializing in fire-tube boilers, and all special shop work such as oil refinery equipment, chemical equipment, alloy vessels, tanks, plate work and the like.

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Arnold G. Lenz, general manager of the Flint, Saginaw and Bay City, Mich., plants of the Chevrolet Motor Co., has been awarded the honorary degree of doctor of engineering by the University of Aachen, Germany, in recognition of his contributions to the progress of foundry practices.

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Edwin H. Kottnauer has been appointed Pacific Coast representative for the Climax Molybdenum Co., New York, with office and warehouse at 1341 South Hope street, Los Angeles. Mr. Kottnauer is chairman of the Los Angeles chapter of the American Society for Steel Treating.

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W. E. Loy, for the past five years president and general manager, Ampco Twist Drill Co., Jackson, Mich., has been named general sales manager of the Union Twist Drill Co., Athol, Mass.

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John Urquhart is the new general superintendent of the Woodward Iron Co., Woodward, Ala., in charge of blast furnaces and coke works. For a number of years he was with the Semet Solvay Co., at Detroit and New York.

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C. R. Burt, president and general manager, Pratt & Whitney Co., Hartford, Conn., has been elected president of the Hartford chamber of commerce.

Wire Cloth Builds Business

Any person now buying one carload of wire cloth, in response to the "buy now" movement, stimulates business to the extent that the following are required for the manufacture of this carload:

Wire, 31,000 pounds; wire rods, 33,000 pounds; billets, 36,000 pounds; ingots, 38,000 pounds; pig iron or scrap, 40,000 pounds; iron ore, 80,000 pounds; coke, 40,000 pounds; coal, 60,000 pounds; limestone, 20,000 pounds.

So states Frank W. Jones, vice president and general manager, Hanover Wire Cloth Co., Hanover, Pa.

Steel Shelving Bids In

Metal Office Furniture Co., Grand Rapids, Mich., is low on steel shelving for the New York postoffice at $16,796; bids Oct. 30.

Died:

HENRY E. BULLOCK, 81, chairman of the board, Illinois Malleable Iron Co., Chicago, at his home in that city, Nov. 8. Mr. Bullock was born in Otterville, Ont., and entered the foundry business at Chicago. He and his brother, the late James C. Bullock, went into business for themselves in 1880 at Rochelle, Ill., moving their foundry to Chicago four years later. Mr. Bullock also was president of the International Malleable Iron Co., Guelph, Ont.

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Earl Thomas Conway, sales manager, Lansing Stamping Co., Lansing, Mich., in that city, Oct. 29.

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Thomas T. Lyman, 70, formerly manager in the Middle West for the Johns-Manville Co., at his home, Evanston, Ill., Nov. 5. He retired from active business several years ago.

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Louis C. Willis, president, Indestructible Wheel Co., Lebanon, Ind., at his office recently. He had been ill four years but three weeks prior to his death returned to work. His home was in Indianapolis.

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Charles M. Schenck, 83, who retired last spring as secretary and general auditor of the Colorado Fuel & Iron Co., and was identified with some of its subsidiaries, at his home in Denver, Nov. 9.

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George L. Mueller, 44, division superintendent, A. O. Smith Corp., Milwaukee, at Milwaukee, Nov. 12. Born in Saginaw, Mich., he was a pioneer in automotive production practice, joining the Smith organization in 1925.

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Richard Waldron Shapleigh, 74, president, Shapleigh Hardware Co., St. Louis, at St. Luke's hospital, St. Louis, Nov. 6. He first went with the hardware company in 1876, and at his death was prominent in civic affairs of the city.

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Daniel G. Milligan, 43, vice president in charge of foreign sales for S. F. Bowser & Co., Ft. Wayne, Ind., and formerly assistant general manager of the company, at his home in Ft. Wayne, Nov. 11. Mr. Milligan joined the Bowser company in 1914.

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Edward Tracy Birdsall, 70, pioneer automotive engineer and active in development of the diesel engine for airplanes, at his home, New Rochelle, N. Y., Nov. 6, after a long illness. He was one of the founders and first secretary-treasurer of the Society of Automotive Engineers. Lately he had been research engineer for Lawrence Engineering & Research Corp., New York.

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Waller Taylor, president, Consolidated Steel Corp. Ltd., Los Angeles, since its organization in 1929, at his home in Los Angeles, Oct. 6, following a two-month illness. Born in Florida and educated at Cornell university, Ithaca, N. Y., he went to California in 1898, being employed by the Llewellyn Iron Works.

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William C. Stratton, 52, general manager, United States Coal & Coke Co., Gary, W. Va., at Gary, Nov. 12, after a two-month illness. Born in Columbus, Wis., he was graduated from Brown university, Providence, R. I., in 1894 and later became associated with the H. C. Frick Coke Co., serving as division engineer until 1919. In 1921 he was employed by the United States company as chief engineer.

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Fred L. Westerbeck, 82, pioneer tin can manufacturer and owner of more than 200 patents pertaining to that industry, at his home in St. Louis, Nov. 10. Born in Germany, he emigrated to the United States with his parents at an early age, and in 1876 organized the first tin can manufacturing plant in St. Louis. He was president of the Columbia Can Co., St. Louis, and for 37 years a director of the Northwestern Trust Co. in that city.

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Edward N. Hurley, 69, executive head of the Hurley Machine Co., active in Illinois manufacturing circles and former chairman of the United States Shipping board, at Passavant hospital, Chicago, Nov. 14. Born at Galesburg, Ill., he organized the Standard Pneumatic Tool Co. in 1896 and sold his interest six years later. In 1907 he formed the Hurley Machine Co., builder of electrical home devices. In 1914 he was a member of the federal trade commission, of the war trade board of President Wilson, and later chairman of the shipping board and president of the Emergency Fleet corporation. Various honors were conferred upon him by American, French, Italian and Chinese governments for his wartime efforts.

Piling Handbook Revised

Revisions and additions for the looseleaf handbook on steel sheet piling, published by the Carnegie Steel Co., Pittsburgh, have been issued, effective Nov. 1. Included are 19 revised pages and seven supplemental pages. The revised pages represent modifications in the Carnegie steel sheet piling series for a new standardized series which was effective Nov. 1.

EDITORIAL

Statistics Should Keep Pace With Changes in Industry

INAUGURATION of monthly reports of shipments of finished steel products by the United States Steel Corp., announced almost simultaneously with the appearance of the "Annual Statistical Report" of the American Iron and Steel institute, serves to emphasize the importance of statistics.

Fortunately the industry has fared much better than many of its contemporaries in the collection and publication of accurate reports on production, prices and many other factors. The record of output of coal, coke, pig iron, ingots and many important finished steel products extends back into the last century. In some cases the production figures are complete for an unbroken span of 50 years. The price history of the industry is surprisingly complete. In recent years a start toward reliable figures on consumption and distribution has been made.

The good fortune of the iron and steel industry in respect to statistics is not accidental. From the early days of steel down to recent times, the compilation of data was attended by difficulties which cannot be appreciated by the present generation. For many years there was a reluctance among the officials of some companies to report details of their operations. Suspicion had to be allayed, the need for accuracy and promptness emphasized, and above all, the value of continuous series of data impressed upon the leaders of the industry.

Pioneers Had To Overcome Reluctance of Companies To Divulge Details of Business

The pioneer in this work was James M. Swank, secretary of the American Iron and Steel association. Much of the credit for the statistics of the early days is due him for his tireless efforts in compiling data in the face of unusual obstacles. His task was made difficult by the fact that the industry was composed of a large number of small units, and that there was only a semblance of cohesion among these hundreds of small companies. Later the business press of the iron and steel industry voluntarily assumed part of the burden. Its contributions include the compilation of monthly pig iron output, inauguration of monthly figures on steel ingot production (later taken over by the American Iron and Steel institute), analysis of the distribution of finished rolled steel, weekly estimates of the rate of steelworks operations (now reported by the institute) and other services.

Following the formation of the United States Steel Corp. in 1901, much of the reluctance to reporting statistics was dissipated by the example set by the Corporation in publishing considerable information regarding its operations. The earnings reports of the majority of producing companies gradually became more expansive as to detail, and throughout the industry generally the disposition to report to a central bureau was more favorable. When the American Iron and Steel institute took over the work of the American Iron and Steel association, much of the problem of educating the industry to the need and value of statistics had been solved. The United States government has compiled many series of statistics pertaining to the iron and steel industry, but its figures in most cases are supplementary to records compiled by other agencies.

Steel Code Instrumental in Prompting Industry To Modernize Statistics

During the past decade, changing conditions in the industry have pointed clearly to the fact that its statistical services must be refined and revised constantly to keep pace with the march of progress. Perhaps the only just criticism that can be made of the generally excellent statistical service of the American Iron and Steel institute is that it has been slow to inaugurate new records for new products and to compile statistics on factors other than production.

Undoubtedly the provisions of the code of fair competition, which were instrumental in prompting the United States Steel Corp. to abandon its monthly record of unfilled tonnage and to supplant it with reports on shipments, will stimulate a modernization of other statistics of the industry.

There is room for improvement in several directions. The important new activities in alloy steel call for more accurate statistics than are now available. More data on consumption, distribution, etc., which are important to improvement in merchandising, would be very valuable. Statistics on the distribution of iron and steel through jobbers would serve a useful purpose.

Under the code, the institute's statistical work assumes greater importance than ever before. For this reason, the present might be a good time to study the statistical requirements of the industry and to adopt a forward looking policy in regard to this essential service.

THE BUSINESS TREND

Weekly Barometers Reflect Slight Improvement

THE stronger tone of business, to which we have alluded in this column in the last several issues, at last is reflected in a number of the weekly barometers.

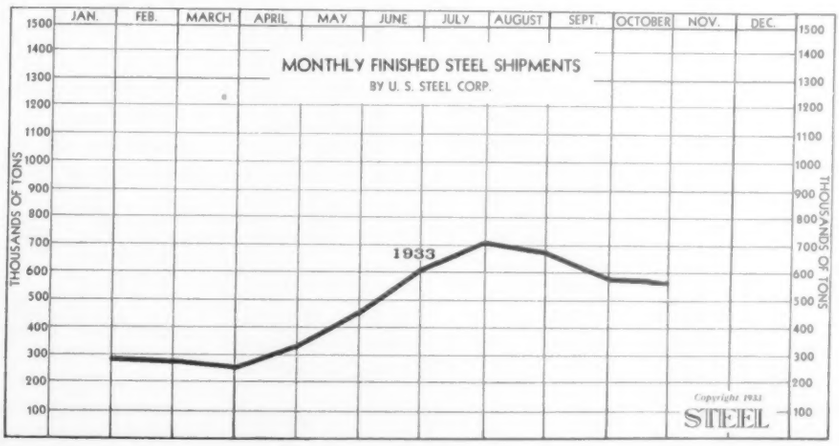
Steelworks operations in the week ending Nov. 18 were a shade higher than in the previous week. The impetus came from public works projects, slightly increased specifications from the automobile industry and modest improvement in the demand from miscellaneous sources. Electric power output in the week ended Nov. 11 was up 2.1 per cent from the previous week and 6.3 per cent from the corresponding week in 1932. It was the most favorable showing in more than a month, but was caused more by cold weather than by increase in industrial demand. Preliminary figures on revenue freight traffic for the week ending on Armistice day indicate a probable gain in the margin of freight volume over that of the corresponding week of 1932.

This slightly more encouraging trend is significant in that it has developed in the face of widespread confusion over the government's monetary policy. At no time since the national bank moratorium has the financial outlook been a more serious obstacle to improvement in industrial activity than during the past several weeks. At no time since March 4 have the methods pursued by the government in its recovery program been criticized as openly and as caustically as in this recent period. But in spite of these disturbing factors, the decline in industrial activity has been checked and in some lines slight improvement has been noted.

Clarification of Dollar Policy Would Give Powerful Impulse To Industrial Activity

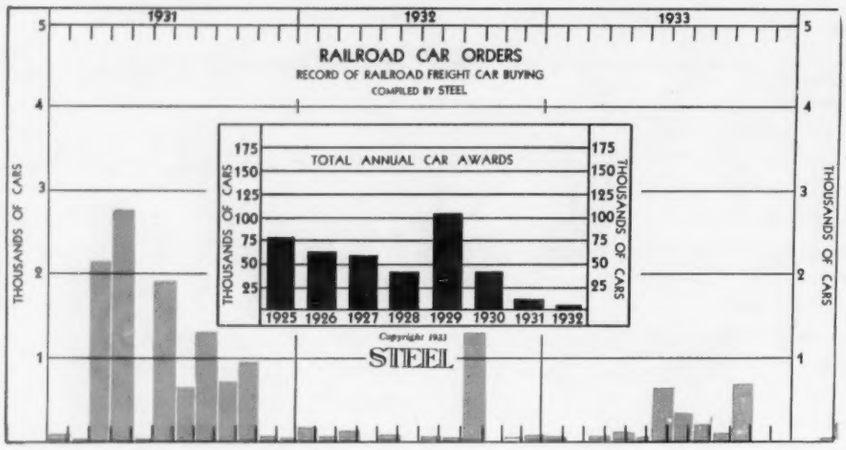
Such progress in the face of serious obstacles raises the question of what would happen if the administration, at an early date, should decide that its recent venture into uncharted monetary seas was unwise and should change its course to the right. Or, what would happen if the administration would explain more clearly its present objective?

A sensible statement of policy on the American dollar probably would help business more at this time than any other conceivable influence.



1933	Tons
Oct.	572,897
Sept.	575,161
Aug.	668,155
July	701,322
June	603,937

1933	Tons
May	455,302
April	335,321
March	256,793
Feb.	275,929
Jan.	285,138



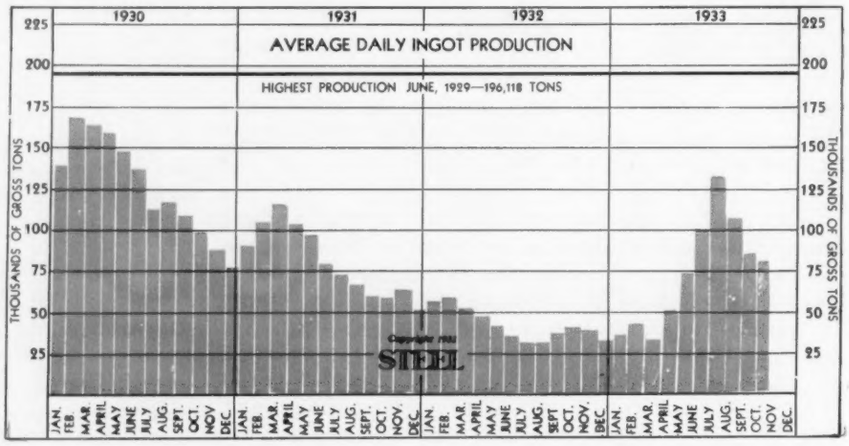
October, 1933	514
September, 1933	23
October, 1932	0

October Freight Car Awards Highest This Year

Domestic freight car awards during October totaled 514 units, bringing the total for the ten-month period to 1611 cars, compared with 1687 cars in the corresponding period last year. There were no awards in October last year while for the same month in 1931, 980 new cars were built. The building of 500 refrigerator cars for Armour & Co. was largely responsible for the rise in October awards.

Steel Ingot Output Down; Operating Rate 37.4 Per Cent

Production of steel ingots in October declined for the third successive month placing the daily rate at 81,225 gross tons, or 37.37 per cent of capacity. In the preceding month the daily output stood at 88,884 tons or 40.89 per cent and in October a year ago operations had dwindled to 19 per cent of capacity. According to the report of the American Iron and Steel institute, the October total of 2,111,842 tons brought the ten-month output for 1933 up to 19,516,437 tons.

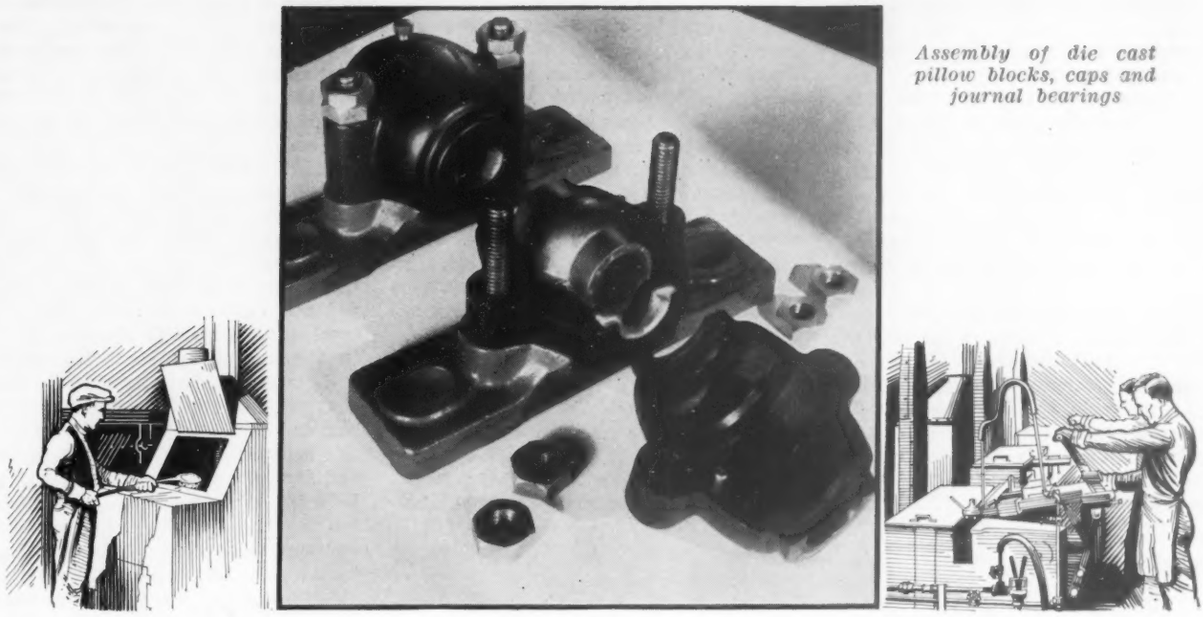


October, 1933	81,225
September, 1933	88,884
October, 1932	41,810

September, 1933	$60,936,370
August, 1933	60,978,216
September, 1932	48,947,045

Railway Earnings Increase 73 Per Cent Over 1932

Class 1 railroads of the United States for September had a net railway operating income of $60,936,370, which was at the annual rate of return of 1.98 per cent on their property investment. This current report, compiled by the bureau of railway economics, shows a very slight drop of $41,846 from the preceding month and marks the second set-back since the July peak when earnings totaled $64,307,068. The total net income for the nine months of 1933 was $340,973,877 compared with $197,832,444 during the same period last year, a gain of nearly 73 per cent.



Assembly of die cast pillow blocks, caps and journal bearings

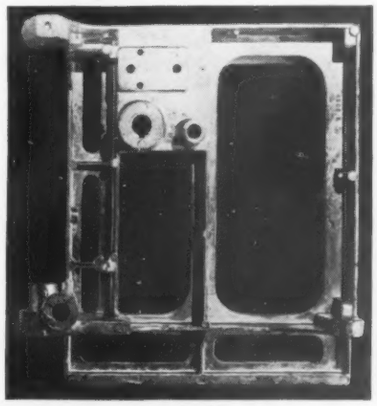
DIE CASTINGS . . . .

¶ Strength, Lightness, Economy and Decorative Appeal Are Combined by Modern Manufacturing Practices

BY A. H. ALLEN
Associate Editor, STEEL

ALTHOUGH the production of die castings is in no sense a new technique, engineers report that practically an unlimited field exists for new applications for this product where light weight, decorative effect and economical construction are desired. Development work lately has been spurred by the availability of new die casting zinc alloys which, in addition to properties providing castings with smooth finish, thin sections and intricate shape, embody a tensile strength of 45,000 pounds per square inch.

The feature of a die casting is that it permits making in a single unit an assembly which formerly may have comprised many small parts joined together by conventional methods. The limit to which die casting engineers are held in regard to intricacy of casting shape is governed only by the skill of diemakers in perfecting complicated dies which will give sound castings, and with the daily appearance of increasingly intricate castings, this limit appears indefinite.



Base for a meat slicing machine—a single die casting

Decorative effects achieved in die castings are becoming well known, such parts as clock cases, automobile hardware and the like, shown in accompanying illustrations, typifying the smooth finish and artistic embellishments attainable. Economical construction is emphasized by the elimination of the need for finish machining, as well the avoidance of any detail assembly costs. While applications requiring resistance to stress are fewer, die castings have been employed successfully in certain parts of a small chain hoist, where strength was a factor.

Both zinc and aluminum alloys are die cast readily and in large quantities. Brass is likewise die cast but as yet in a more limited field.

Complete die casting facilities are in operation at the plant of the Doehler Die Casting Co., Toledo, O., a pioneer in this field. The plant is ideally laid out for straight-line production methods, materials being received and stocked at one end, following through melting, casting, finishing and inspection, to

be shipped at the other end of the building.

Machines for casting zinc-base alloys are located in two rows at one side of the plant; and machines for casting aluminum alloys along the other side. All casting machines have been designed and built by engineers of the company. The evolution of the die casting machine is clearly evident by comparison of modern equipment with earlier models.

An early design for casting zinc, now becoming obsolete, is the swinging type or tilting frame machine. In this type the dies are open while the frame is in the horizontal position. For casting, the dies are closed manually, the entire frame swung up to a vertical position and the molten zinc forced up into the closed dies; then the frame is lowered, the dies opened and the casting removed. The idea behind this type of machine is that it was formerly thought necessary to break the connection between the dies and the nozzle through which the molten metal was forced, in order to prevent freezing up of the metal in the nozzle.

GEARS and frame for soft drink vending machine, all of zinc die castings. The complete unit is enclosed in a die cast case

Change to Horizontal Type

Subsequently this was found to be unnecessary and the tilting feature of the machine was eliminated, the next type being the horizontal air back machine, in which the dies were forced together by the action of compressed air, although locked in position manually. A pressure cylinder, submerged in the bath of molten metal and air operated, forces metal into the dies.

Later, seeking to obviate the use of compressed air, the power back machine was devised, in which the opening and closing of the dies is accomplished mechanically through a toggle. On both the former type machines an operator is required to control opening and closing of the dies, injection of the metal and removal of the finished casting. To relieve the operator of some of this manual labor, an automatic-type machine has been designed, some of them being operated at the present time. It is known as an angular, power back, mechanical stroke machine and requires the operator only to remove the casting from the dies, all other movements being regulated automatically. For mechanical reasons this machine is not exactly horizontal, being inclined slightly to permit clearance of certain connection arms.

Aluminum die casting machine are of the air-back and power-back types, with a gooseneck connection from the melting pot to the dies. This comprises a U-shaped tube partially submerged in the molten aluminum. When the dies are closed and locked, this gooseneck is tilted slightly, forcing the mouth tightly against the opening in the dies. An air operated piston forces metal into the dies under a pressure of about 500 pounds per square inch.

Temperature of the molten metal in the reservoirs is closely regulated by means of separate automatic temperature control instruments connected to each machine. A gas burner is provided for keeping the metal hot and its firing rate is regulated by the control instruments. Probably no single development has aided more materially in the production of high quality die castings than the adoption of temperature control equipment on the die casting machines. Freezeups are largely avoided, the metal is kept at maximum fluidity and production is carried out with few interruptions, all without the necessity for any manual attention to metal heating in the machines.

It is pertinent to follow through the production of a typical casting. Metal is received in pig form and stacked for charging into melting furnaces. Aluminum is charged into a rotating cylindrical furnace, end fired. Temperature is raised to 1200 degrees Fahr., and as the metal is needed in the casting machines, it is poured from the melting furnace into small ladles suspended from a monorail conveyor. The monorail is routed past all the casting machines and the molten metal is easily transferred from the ladles to the machines.

Zinc likewise is melted down before being supplied to the casting machines. Stationary pot-type furnaces with hoods are operated to melt down this metal. Large cast-iron pots, lined with a special water paint to prevent any iron from becoming alloyed with the zinc are set in these furnaces and the pig zinc and any desired alloying metal charged into them. These pots are handled by crane when removal from the furnace is necessary. Gas burners fire around the base of the pot, bringing the metal to a maximum temperature of 800 degrees Fahr. Fumes are carried off through hoods to a stack, the hoods completely enclosing the furnace when it is operating. Hinged doors in the hoods permit access to the interior.

The molten zinc is removed from the furnace by a motor-driven pump which forces the metal through a pipe into a small buggy. An attendant pushes this buggy around to the various machines as replenishment of the zinc supply is required. The metal is transferred from the buggy to the machine by means of small hand ladles.

Control of Machine Is Simple

Operation of the die-casting machine has been previously sketched and is essentially a simple process, the operator setting the machine in motion, locking the dies and actuating the piston which forces metal into the dies. The dies are then opened mechanically and the operator removes the completed casting and transfers it to a tote box which, when filled, is wheeled to the inspection department for a preliminary examination.

Removal of scrap metal, gates, and the like, from the casting is usually done by hand except on castings where close tolerances must be observed. In the latter case, the casting occasionally is put through a trimming operation in a press where trimming dies remove any adhering metal and trim up the casting to shape. Hand filing serves to finish many castings satisfactorily.

Rigid inspection of both castings and machines is maintained at all times while machines are in operaton. An inspector regularly checks up on die dimensions and die conditions. If a die is worn or checked, it is removed from the machine quickly by a crane and transferred either to the repair department or to scrap. All finished castings likewise are given several inspections for cracks, seams and check marks.

No heat treatment of the finished

product is required except on zinc die castings where dimensional tolerances are limited, and any change of size as a result of aging is undesirable. In this case the castings are introduced into an oven where an accelerated aging treatment at low temperature is carried out.

The heart of the die-casting operation, of course, is the dies themselves and it is here that steel plays a major role. With the wide variety of castings being produced regularly a large number of dies must be designed and tooled out to keep abreast of production requirements. With zinc castings, approximately 200,000 shots can be obtained from a single die; whereas with aluminum castings this number is somewhat less, ranging up to 100,000.

Each die is made up of two halves or sections, with vertical parting. The rear section is held stationary in the machine while the front section is attached to the movable arm on the machine. When casting, the two parts are brought together and locked firmly. Care must be taken to see that the mating surfaces of the dies fit together closely, to avoid the possibility of molten metal squirting out between the die sections. The rear die section has a hole drilled at its center, known as a gate, through which metal is admitted from the nozzle of the casting machine. A flame usually is kept playing on this nozzle to prevent metal from solidifying at its end.

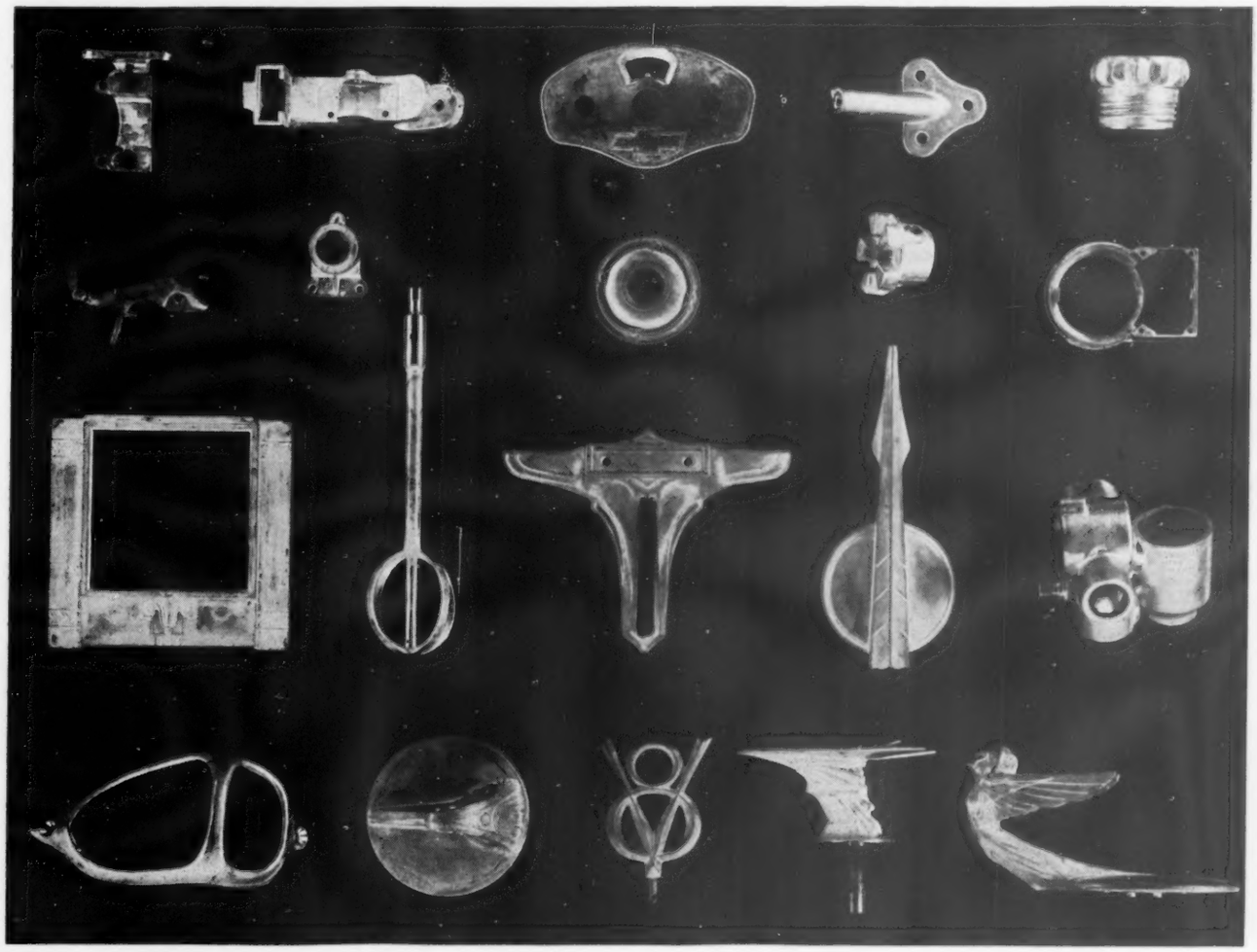
Considerable ingenuity is required in the design of many of the dies used. A complicated casting often will require a die made up of several parts, carefully dovetailed together to form the finished block. Often cores of complicated shape are required which must be inserted in the die by the operator of the die-casting machine before the dies are closed. Some castings call for steel or other metal inserts which must be placed in proper position in the dies.

Castings of complicated shape often cannot be removed by the operator when the dies are opened and to facilitate removal of the castings ejector pins must be located in the dies to force the casting out when the dies are opened.

For production of small castings it is naturally expensive to use a die in which only one impression of the part to be cast is made. To overcome this situation combination or multiple dies are used in which several impressions of the part to be cast are machined and with a single shot of the machine, four or five castings are formed, all being attached to the same gate. A further development of this idea is the unit die system in which a master die is used, with space available for inserting several smaller die units, the latter embodying a single impression, combination or multiple impressions. With this setup, the maximum use can be made of a die-casting machine and as many as 20 or 30 small castings formed with one shot.

To handle the many hundreds of dies which must be turned out regularly, a large department is maintained for designing, machining and assembling the dies. A sizeable stock of a wide range of alloy steels is kept on hand for die requirements. All steels are marked by painting and kept in order in racks. Complete furnace equipment is available for heat treating and quenching as well as nitriding.

DISPLAY of a number of typical zinc die castings currently in production. Included are several varieties of automobile radiator ornaments, speedometer cover plate, case for electric clock, outboard motor carburetor and miscellaneous small parts. These objects are shown as they come from the die casting machine, no finish treatment having been given them



Making Concentric Sections By Roll-Forge Process

PRODUCTION of round steel parts, such as shafts, bearings, balls, or other parts concentric throughout their axial length, as well as blanks later to be forged into irregular shapes, is made possible in a unique roll-forge machine developed recently. In this machine, the stock—round or square bars heated to rolling temperature—is reduced and formed as it passes between two formed rolls and at the same time is rolled in a transverse direction in much the same manner as a pencil is rolled between the palms of the hands.

Form Cut in Rolls

Top and bottom rolls are identical, ranging from 10 to 18 inches diameter, and are formed by straight cutting across the entire roll face. In operation, they are registered from the keyways and are synchronized so that the cut form in the upper roll matches the cut form in the lower roll. By way of illustration, if the forging to be produced is a ball, then each roll would have cut into its face a series of semicircular grooves extending across the full roll face. When the upper and lower rolls are matched, the two opposing grooves would provide an opening which is of circular cross section.

A feature of the machine is that the two rolls are made to oscillate on their axes; as the upper roll moves to the right, the lower one moves to the left. The oscillating action operates simultaneously with the forward feeding and because of this arrangement, the bar being roll forged is essentially rolled in two directions at the same time. Thereby, the product becomes concentric and is made to conform to the cross section which is embodied in the roll faces.

High Reduction Possible

The process and machine were developed by F. W. Trabold, 825 Fox building, Detroit, and within its limitations is claimed to produce forms in volume and at reductions heretofore unobtainable. Reductions from 2 inches to ½-inch and in similar proportion can be accomplished in a single pass, it is said.

Using rolls from 10 to 18 inches diameter and speeds from 5 to 20 revolutions per minute, forward speeds of from 12 to 100 feet per minute are possible. Thus production of forgings close to size is obtained in unusual quantities per hour. For instance, at the 50 feet per minute speed a forging 6 inches long would have a production of 100 per minute, or a potential of 6000 per hour. This average forging would be produced in a drop hammer at a rate of approximately 200 or less per hour; drop forging would require the services of two men, the roll-forge process requires only one man.

The process naturally produces no flash, and metallurgically is claimed to be superior by reason of all the original bar fiber being retained in the parts. Furthermore, the absence of flash represents considerable saving in material. It is stated that all forms of concentric shapes can be produced and that the rolls are inexpensive, for no die sinking, as such, is involved.

When the process is used for making blanks for subsequent forging into irregular shapes, it is claimed that the practice produces accurately formed and uniform blanks, eliminating break-down, edging and fullering work in the drop hammer, and reducing normal wastage and shrinkage considerably. Die life, when blanks are made by the roll-forge process, is understood to be several times average life in present practice. There is practically no washing of the die faces due to pounding on cold flash, for by the use of closely sized and uniform blanks, the flash develops only in the last few blows.

Further Work on Blanks

An unusually wide variety of irregular shapes can be produced from these concentric blanks, it is stated, in many cases where subsequent hammer work is involved only a bending or edging operation will be required.

Construction of the machine will be observed in Fig. 2. The gears on the left side provide the revolving motion of the rolls; the bell crank mechanism on the right side controls the oscillation of the rolls. Oscillation speed and roll revolutions normally are in the proportion of about 10 to 1, however, this ratio would vary with the shapes and character of work and finish desired. Fig. 1 shows stock being fed into the machine and Fig. 3 shows the concentric forging coming out of the machine.

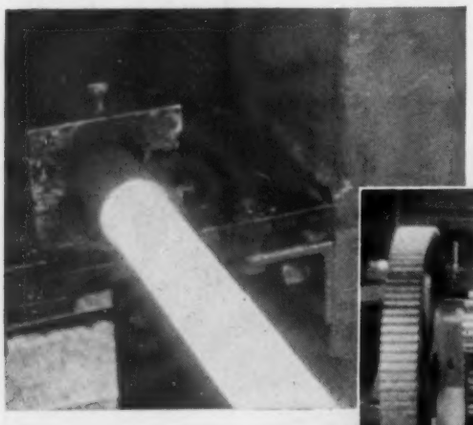


FIG. 1 (above)—This shows a heated round bar being fed into the roll-forge machine

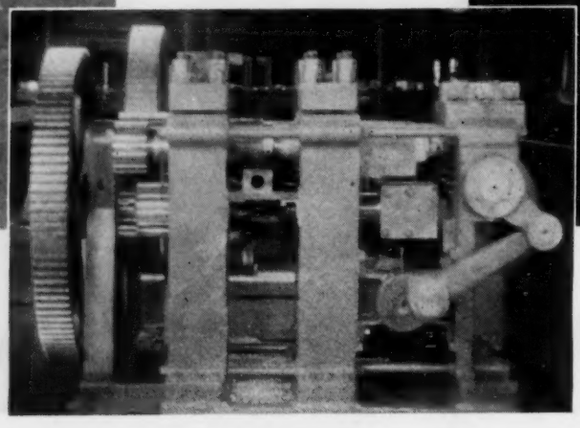


FIG. 2 (below)—The roll-forge machine as it appears from the stock feeding side

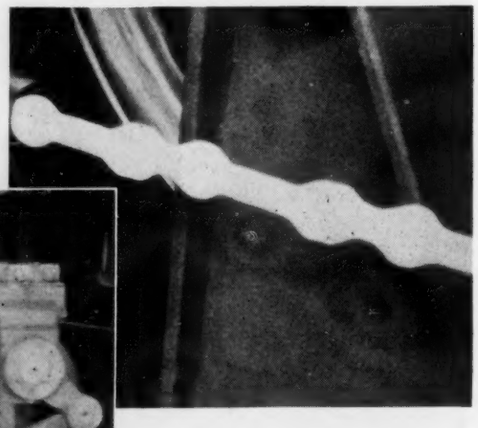


FIG. 3 (above)—Here is shown the rolled or completed bar coming out of the machine

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Performance records of PHOENIX Rolls continue to exceed even the high standards set by the company in the past. This constant improvement in quality is the result of distinctive knowledge and broad experience in connection with metallurgy and heat treatment. It is the constant endeavor of this company to make every roll shipped better than the one preceding it.

PHOENIX Steel
For unusual strength

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For strength and wear

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For strength, wear and finish.

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PITTSBURGH ROLLS CORPORATION
PITTSBURGH, PA.

The Plastic Forming Of Metals

By PROFESSOR DR.-ING. ERICH SIEBEL
Translated by JOHN H. HITCHCOCK

Part 1—Laws and Fundamentals of Plastic Forming

5. Classification and Analysis of Forming Process

TECHNICAL forming processes can be classified according to various points of view. If the properties of the formed material are used as a basis, the classification, as has already been seen, is made according to hot-forming and cold-forming processes. For the following analysis, it seems more suitable to set up the classification according to the force effects. Forming processes in which direct pressure is used then can be distinguished from those using indirect pressure; if forming by means of bending be excluded.

Height Is Reduced

In forming by means of direct pressure, the body to be formed becomes reduced in height between two surfaces which move toward each other and through which the forces are applied. The material then flows at right angles to the direction of compression. The principal processes in which these conditions exist are pressing, forging, and rolling. Indirect pressure, on the other hand, occurs when the body to be formed is carried through a narrowing tool or die, by the application of external tensile or compressive forces which act in the direction of movement. Under these conditions, the outer forces produce a reaction pressure on the walls of the forming tool. The deformation is caused by the reaction pressure, acting in conjunction with the stress field produced by the primary forces. Forming by means of indirect pressure is most common in drawing processes of various sorts, as well as in the extrusion and piercing processes. A summary of the common forming processes, with examples of their application and a designation of the forming arrangements, is given in Tables 1 and 2[40].

A useful method of approximation for the investigation of forming processes is provided by the assumption that the body in question, or its individual parts, is transformed by a simple parallelopipedal deformation from the initial to the final form. As Fig. 20 shows, such a method of treatment is possible in forging, rolling, and drawing, and also in most other forming processes. The body concerned is considered as being divided into a number of elements, which are transformed from form I to form II by means of the deformation. The deformation of all parts corresponds to the change in outer dimensions of the entire body.

The theoretical requirements of force and work, which are necessary for the forming of each body element, then can be calculated by means of the derived conditions, as soon as the deformation strength of the material is known; and by adding the values obtained from the individual steps, the requirements of force and work for the entire process can be determined. The values of force and work actually developed are always greater than those indicated by this method of consideration. The reason for this fact is that the described method of approximation gives no consideration to the actual sequence of deformation, as it is determined by the cohesion of the material and the peculiarities of each forming process. Because of these effects, additional displacements, together with greater deformations and a greater expenditure of energy, are unavoidable.

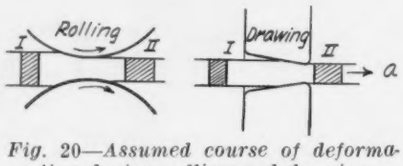

Fig. 20—Assumed course of deformation during rolling and drawing

Friction Is a Factor

Moreover, friction effects on the surfaces of contact between the formed pieces and the forming tools enter into consideration, and are accompanied by an increase in the requirements of force and energy. In the rolling process, for instance, the simple downward compression of the individual body elements, upon which the calculations and the sketch in Fig. 20 are based, is not the sort of deformation which occurs in practice. Instead, a distortion of the individual elements, as shown in Fig. 21, occurs during the passage through the rolls. A similar situation, as the illustration also shows, exists in the case of drawing. In the latter case it is at once evident also that friction losses must occur during the displacement of the wire through the die. Similar conditions hold for all other technical forming processes.

How Value Is Computed

Now, if the ratio is known between the calculated work, A_{id}, for pure forming without losses, and the total energy, A, which is consumed during deformation in a certain forming process, then the requisite forces and the actual work of deformation can be calculated from the values for the ideal forming process. This ratio is defined as the efficiency of the forming process, or deformation efficiency, and is deignated by η. The work of deformation is then:

$$A = \frac{A_{id}}{\eta} \quad \text{.....(22),}$$

and the required external force is:

$$P = \frac{P_{id}}{\eta} \quad \text{.....(23).}$$

Because the knowledge of the deformation efficiencies is a prerequisite for the use of this method of consideration, it is necessary to carry out comprehensive tests for the individual forming processes, to determine the deformation efficiency and the resulting losses in comparison to the theoretical relations. Investigation of the deformation efficiency is of even more distinct importance, because this quantity is a criterion which establishes the merit of the process considered from a technical point of view, and which shows the extent of possible improvement in each process. The fact also should be considered that a lower deformation efficiency usually is accompanied by higher stresses in the material and in the forming tools. For this reason, as favorable conditions as possible are desired, in order to avoid possible injury to the material and unnecessary straining of the tools.

In order to obtain conclusions regarding the deformation efficiency of a forming process, it is necessary to

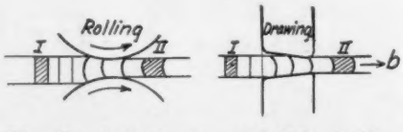

Fig. 21—Actual course of deformation during rolling and drawing

[40] Werkstoffhandbuch Stahl und Eisen, Warmformgebung; ferner Hutte, 26th edition, vol. II, p.710/711.

5% TO 102% INCREASE IN PRODUCTION *with*

J&L *Improved* BESSEMER SCREW STEEL

NO CHANGE IN CHEMISTRY OR PHYSICAL PROPERTIES

102.2% PRODUCTION INCREASES
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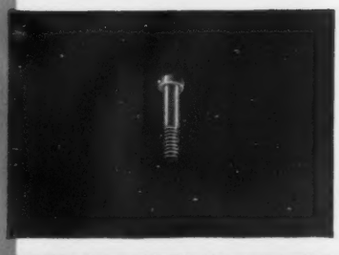

57.1% PRODUCTION INCREASE
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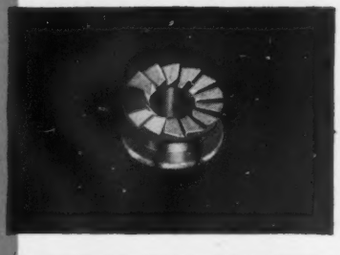

38.5% PRODUCTION INCREASE
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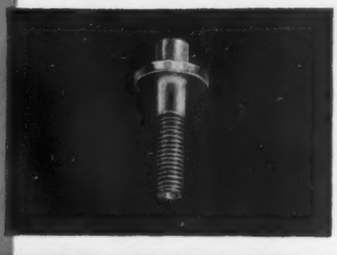
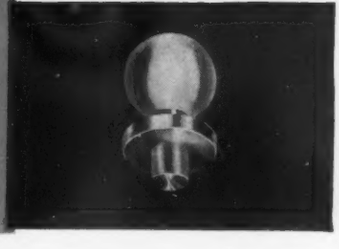
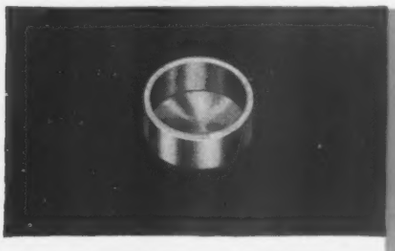
Bessemer Screw Steel



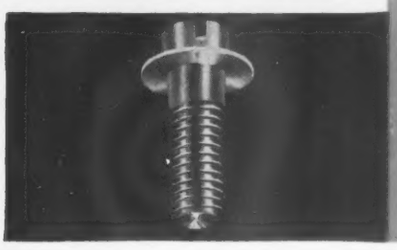
5% PRODUCTION INCREASE
½" Round, Cold Drawn
J & L *Improved*
S.A.E. 1112



5% PRODUCTION INCREASE
⅝" Round, Cold Drawn
J & L *Improved*
S.A.E. 1112



20% PRODUCTION INCREASE
¾" Round, Cold Drawn
J & L *Improved*
S.A.E. 1112



18% PRODUCTION INCREASE
¾" Round, Cold Drawn
J & L *Improved*
S.A.E. 1112

THE radical improvement in the machining quality of J & L *Improved* Bessemer Screw Steel is reflected in the production increases secured in making the parts shown. In addition, improved appearance was obtained. These are but a few of the many cases reported to us. This improved machinability is found in both S.A.E. 1112 and J & L Special High Sulphur Bessemer Screw Steel, in hot rolled bars, cold finished bars, and drawn wire. Write for descriptive bulletin.

J&L STEEL

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measure the actual requirement of force or energy during forming, and to compare these measured values with the required values as computed for the ideal process. The method, which has been derived for this purpose, will be made clear in the discussion of the individual forming processes. It also seems desirable to investigate the accompanying losses more precisely and to distinguish between internal and external losses. A purely analytical determination of the internal losses due to additional displacements involves extraordinary difficulties. Experimental methods of determining these losses are demonstrated in the last part of this treatise.

Estimation Is Possible

On the other hand, it is frequently possible to estimate the external losses due to the friction produced on the forming tools, by means of simple approximate calculations. According to the proposal by E. Siebel[41], it is assumed that the friction forces are uniformly distributed over the cross section considered. These forces then produce a stress in the transverse direction, which opposes the flow of material, and which is designated as the resistance to flow.

The determination of the resistance to flow which is exerted in the transverse direction is of particular importance inasmuch as this re-

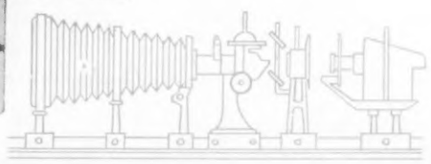
[41] E. Siebel: Grundlagen zur Berechnung des Kraft—und Arbeitsbedarf beim Schmieden und Walzen; Ber. Walzw-Ausch. V. d. Eisenh. 28 (1922); St. u. E. 43(1923)p.1295.

Table I

Hot Forming Processes

Process	Method of Action	Application	Machine
Forging	Compression of longitudinal axis of bar	Wheel blanks and tires	Steam hammer, hydraulic press
		Upsetting flanges and collars	
		Forging and piercing rings	Horizontal forging press
		Upsetting screw-heads bolt-heads, rivets, valve cones	Vincent press
		Bolts	Bolt-heading machine
		Nuts	Hot nut press
		Flanges and couplings from tubes	Tube-forging press
Lengthening by forging	Elongation of bar by transverse compression produced by two opposing hammer dies	Square, round, and shaped bars	Steam, pneumatic, or mechanical hammer, hydraulic forging press
Flattening	Lateral extension of material by transverse compression produced by two opposing hammer dies with rounded surfaces	Hoes, shovels, spades, scythes, knives	Pneumatic or mechanical hammer
Drop forging (hammer and press)	Forming by effect of compression in hollow forms consisting of several parts	Metal parts for vehicles	Steam hammer, steam drop-hammer
		Gear blanks, disks, hibs	
		Axles, connecting rods, levers	Drop-hammer
		Front axles, crankshafts	
		Large hubs and pressed parts	Hydraulic press
		Pressed metal parts	Screw press
Shape forging	Forming by stretching, in connection with separating, upsetting, and bending operations	Shafts, axles, bars, levers, disks, rolls, and other small and medium-sized forgings	Pneumatic hammer
		Heavy forgings, such as marine shafting, crankshafts, rotor bodies, drums, rings, tires	Hydraulic press
		Rings and tires	Steam hammer
		Preforging of drop-forged pieces	Pneumatic hammer
Rolling	Stretching material and forming cross section by compressive and stretching action of rotating rolls	Rolling ingots to blooms, billets and slabs	Rolling mill
		Bars, universal plates, strips and wire rod	Roll train
		Armor plate, plates and sheets	
		Beams, rails, sleepers, channels, angles and special shapes	
		Lap-welded and seamless tubes	Tube mill
		Wheel-blanks, tires, boiler shells	Special rolling mill
		Knives, insulator bars, and other parts	Die-rolling mill
		Rolling threads on tie bolts	Hot-threading rolls
Extrusion	Pressing material subjected to pressure from all sides, through orifice or outlet die of an enclosed chamber	Bars, shapes and tubes from copper, brass, aluminum and lead	Hydraulic extrusion press
Piercing	Production of hollow billets (a) By skew rolling (b) By piercing with mandrel in container	Hollow billets by Stiefel and Mannesmann processes	Skew-rolling mills
		Hollow billets by the Ehrhardt process	Hydraulic piercing press
		Containers, car-bumper shells	
Tube drawing	(a) Reduction of wall thickness by longitudinal tension and direct compression between die and mandrel (b) Reduction of diameter by longitudinal tension and reaction presure in die	Containers, car-bumper shells	Hydraulic drawing press, pushbench with reversed drive
		Tubes having correct outer diameter	Chain drawbench
		Buttwelded tubes	
Arching	Arching of plates between convex ram and concave form	Forming armor plate	Hydraulic arching press
		Arching boiler and tank heads	
		Buckle plates	
Flanging	Flanging edges of plates	Arched boiler and tank heads	
Bending		Prebending motor crankshafts	Hydraulic press
		Forming partition walls	
		Metal framework and crankshafts for agricultural machinery	Crank press
		Bending sheets	Hydraulic press
Shearing	Separation of material by moving shear knives	Cropping, cutting to length, of ingots, slabs, plates, sleepers, bars	Hydraulic billet shear, crank or rotary shear
Sawing	Separation of material by rotating toothed disk	Separation of billets, rails, etc.	Hot saw
Trimming	Removal, by cutting-edge and stamp, of flash produced in drop forging and pressing	Removal of flash from die-forged bars and pressed pieces	Hydraulic trimming press, crank press

The Microscope TELLS WHY



the RUST RESISTANCE OF TONCAN IRON IS *uniform throughout*

Year after year, users of sheets and pipe continue to buy Toncan Iron and to pay a premium for it.

There must be a reason. There *is* a reason. What that reason is you can easily learn if you put Toncan Iron to the test of service. But service tests take time and perhaps you must make a decision quickly.

So let the microscope and a metallurgist tell the story briefly: Toncan Iron is a true alloy of refined iron, copper and molybdenum, made under the most careful supervision in the open-hearth furnace by men skilled in the making of fine alloys. The addition of molybdenum to the refined copper-iron produces a metal that is structurally uniform and of fine equi-axed grain structure. This uniformity extends throughout the entire mass of the metal and imparts a uniform resistance to rust that is not confined to surfaces or segregated areas. The microscope shows the uniformity of the grain structure and the freedom from oxide inclusions. This means that when rust starts, its action is retarded by the united front presented by the uniform mass of highly rust-resistant alloy grains.

All this means a longer-lasting metal—a metal that is more economical in spite of its slightly higher cost. And this is really the reason why users of sheets and pipe buy Toncan Iron—because it is made to give more service per dollar invested.

For information on Toncan Iron Sheets—"The Path to Permanence;" on pipe—"Pipe for Permanence." Either or both of these books will be sent on request.

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sistance determines the flow of material in many forming processes. If the shape of the forming tools permits any flow of material whatever, in so far as it is consistent with the laws described in Part I, the material displaced under the compressive action of the forming tools naturally flows in the direction of least resistance. As will be shown later, extensive predictions concerning the flow of material in rolling and pressing can be made.

How Efficiency Is Determined

The deformation efficiency can be determined only when the deformation strength of the material can be established definitely for the existing external condition. Although it is possible in cold forming to determine the deformation strength by means of simple tensile tests, and to calculate the requirements of work for ideal deformation, the determination of the deformation strength in hot working involves difficulties. Hot tensile tests, aside from the fact that they are not simple to carry out, can provide no useful values, because their velocity of deformation is much less than that of the technical forming processes. Deformation strength in hot working, however, is related closely to the velocity of deformation.

Conditions Are Variable

In compression tests under the press also, the velocity is usually much too small, whereas in dynamic compression tests the conditions are poorly suited to obtain an exact value of strength. Especially in hot working, therefore, determination of the deformation efficiency is frequently neglected. In such cases, it is sufficient to consider the total deformation strength of the material, measured under various sorts of test conditions in the forming process considered; and to draw, from the variations of this quantity, retroactive conclusions regarding the course of the deformation. This method also can be used to advantage in tests on cold-forming processes.

By introduction of the deformation resistance, K_f, which already includes all forming losses, equations (17) and (22) for the work of deformation produce the condition:

$$A = \frac{A_{id}}{\eta} = V \times [\phi_h] \times \frac{k_f}{\eta} = V \times [\phi_h] \times K_f = V_d \times K_f \quad \ldots\ldots (24).$$

Value of Deformation Work

The actual work of deformation is accordingly equal to the product of the volume of the deformed body, the maximum principal deformation, and the deformation resistance. This product is also equal to the displaced volume multiplied by the total deformation resistance.

A similar condition holds for the external forming forces. In forming by means of direct pressure, and considering the forming losses, the resulting force, P, which is exerted nor-

Table II

Cold Forming Processes

Process	Method of Action	Application	Machine
Upsetting	Compression of longitudinal axis of bar	Small bolts, rivets, nails, etc.	Cold rivet press, nail machine
Stamping and coining	Compression in bipartite hollow forms (ram and matrix), with displacement of material along outer surface	Sizing drop-forged pieces	Toggle-joint press
		Coins, medals, type	Screw press
		Forks and spoons	Drop hammer
Rolling	Elongation of material by compressive and stretching effects of rotating rolls	Strip and wire rod	Cold-rolling mill
		Forks and spoons	Gap-rolling mill
		Pointing wire	Pointing rolls
		Rolling threads on screws and bolts	Thread-rolling machine
Wire drawing, cold drawing	Elongation of material by longitudinal tension and reaction pressure of die	Wire	Wire-drawing machine
		Drawing bars, shafting, shapes	Drawbench
Tube drawing	(a) Reduction of wall thickness by longitudinal tension and indirect compression between die and mandrel or between die and bar (with and without mandrel)	Tubes	Drawbench
	(b) Reduction of diameter by longitudinal tension and reaction pressure of die (sinking)	Tubes	Drawbench
Deep drawing (a) Cup drawing (First draw)	Drawing a plane section into a matrix die with radial tension and tangential compression in overhanging edge of sheet	Cup-shaped articles from sheets	Wheel draw press, crank draw press, punch press, crankpress (stamping), multiple press
(b) Subsequent drawing	Elongation, with constant wall thickness, of hollow body produced in first draw	Cup-shaped articles	
(c) Ironing	Elongation, with diminishing wall thickness, of hollow body produced in first draw	Cartridges and cartridge shells	
Stamp drawing	Compression in bipartite forms, with bending or arching of section	Watch-case, buttons, etc.	Screw press
Spinning, planishing	Forming sheets by pressing them between a roll and a form	Round hollow bodies	Spinning lathe
		Smoothing hollow vessels	
		Rolling threads on hollow bodies	
Bending		Toys, typewriter and billing-machine parts, coathangers, etc.	Crank press, screw press
Flanging, rolling-up, folding	Bending-over the edges of sheets	Automobile frames and other heavy parts	Hydraulic press
	Joining articles by bending edges together	Pressed metal parts	Crank press, folding machine
Straightening (Leveling)	Removal of curvatures by bending the bar one or more times	Billets, shapes, beams, rails	Straightening press, roller-straightening machine, bar-straightening machine
Reeling	Passing bar between obliquely-placed rolls rotating in same direction	Straightening and sizing shafting and tubes	Reeling machine
Shearing	Trimming material by moving shear knives	Trimming bars, flats, sheets	Crank, circular, or roll shear
		Shearing strips	
Stamping, punching	Separation of material by cutting-die and stamp	Sheet-blanks for further working	Crank press, punch press
		Punching holes in sheets and construction parts	

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mal to the pressure areas, F, is given by:

$$P = \frac{P_{id}}{\eta} = F \times \frac{k_f}{\eta} = F \times K_f \ldots\ldots\ldots (25).$$

The forces exerted on the pressing tools accordingly correspond to the product of the area of pressure and the total deformation resistance.

The relations in forming by means of indirect pressure are somewhat more difficult. The use of the energy theory is the simplest method of attack in this case. If the external and internal work of forming are equated, the external force, P, which is applied over an area of cross section, F, either in front of or behind the forming tool, in a displacement movement, l, is given by the condition:

$$P \times l = A = F \times l \times [\phi_h] \times K_f;$$

and the external force is then:

$$P = F \times [\phi_h] \times K_f = F_d \times K_f \ldots\ldots (26).$$

This corresponds accordingly to the production of the cross sectional area, the deformation, and the deformation resistance, or the average value of the total deformation resistance if the latter is variable (as in cold-forming). If the conception of the displaced area of cross section, F_d, as the product of cross sectional area and deformation, is retained, equation (26) becomes simplified as shown. The sign of the force is determined by the fact that it always must be applied in the direction of movement of the piece being worked. It is possible in many cases, by means of the equation used here, not only to determine the external forces in the forming processes which employ indirect pressure, but also to obtain conclusions regarding the stress distribution under which forming occurs.

The mechanical efficiency of the machines employed in the execution of forming processes is usually by no means high, so that only a varying but seldom large part of the total power produced by the driving unit is applied as useful work in the forming operation itself. In many cases, the determination of the total work, as well as of the actual useful work of the forming mechanism, presents no difficulty. The determination of the former quantity is much simplified by electrical drive of the forming machines, because in that case a recording wattmeter or a watt-hour-meter suffices for this purpose. The determination of the useful work is possible in many cases by the measurement of force on the forming tools. The type of tests, which appear to be valuable at present, therefore, are tests on the forming losses themselves, because such tests will show where deficiencies exist, and where improvement promise a considerable profit.

The last part of this treatise contains a series of investigations, the purpose of which was to obtain more extensive conclusions regarding the stresses and deformation relations in various common forming processes, than is possible with the previously described methods of analysis. Since a purely analytical treatment fails in this respect in most cases, it is necessary to resort to experiment. It is hoped that in this manner, the bases will be provided upon which an exact solution of the problems in question can later be stated.

(To be Continued)

Steel Provides Flexible Construction For New Service Station Building

ALL-STEEL construction is embodied in a new type of service station designed by the Austin Co., Cleveland. The building, one being shown in the accompanying illustration, is largely prefabricated, with the supporting frame, walls, sash, interior trim and roof entirely of steel. Exterior is made up of insulated steel panels which are porcelain enameled in bright colors. Interior walls are also of steel and resemble a flush-type office partition.

Steel walls are shipped to the site of erection in sections and are bolted together, resulting in a portable type of construction which may be moved to another location or altered to suit demands. Although modern architectural lines will prove more economical, the method of construction is flexible enough to permit any style of architecture—Colonial, English or Spanish.

Porcelain enamel finish on the exterior lends itself to a wide range of attractive color combinations which serve to enhance the trade drawing power of such a building, an important advantage from a gasoline and oil marketing angle. By means of skillful lighting arrangements, attention of motorists is further attracted at night. Maintenance costs are low, since repainting is unnecessary.

Roof and walls are insulated against heat, cold and sound. A heavy thickness of insulating board cemented to the exterior panels acts as an insulator against heat and cold, stiffens the enameled panels and takes out metallic sounds. Steel naturally provides a construction that is entirely fire safe.

The Austin company is prepared to handle each construction project complete, including station, driveways, etc. under a single contract, or, if desired, will assume responsibility for the station structure alone.

New Grinding Machines To Be Shown in Exhibit

Several new grinding machines will be demonstrated and shown for the first time by the Norton Co. at an educational exhibit to be held in its factory in Worcester, Mass., during the week of Dec. 4. Among the new items will be a motorized tool and cutter grinder, a small hydraulic surface grinder with automatic cross feed, a line of cylindrical grinders, an automatic electric sizing device, a crankpin grinder, and an automatic machine for grinding the cam contours on camshafts.

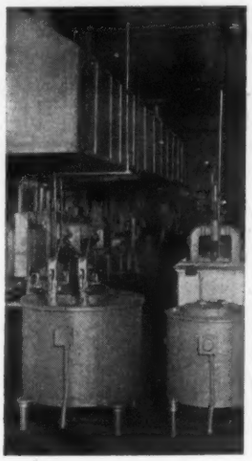
In addition, the company will demontrate a large roll grinder, a car wheel grinder, a 10-inch cylindrical grinder and a lapping machine.

Provides Data on Stainless

Data on properties and applications of Silcrome corrosion and heat resisting steels, recently introduced products of Ludlum Steel Co., Watervliet, N. Y., are contained in a two-page chart, available from the company. Chemical analyses of the various grades produced, tensile and general properties, and a summary of characteristics of the six general types are listed.

Making the Most of METHODS AND MATERIALS

ADVERTISING PAGES REMOVED



HARMFUL effects from chromium compounds can be wholly eliminated or reduced to a minimum so that the risk to workmen becomes negligible. All operations involving the use of these compounds should be localized in departments completely separated from other departments of the plant. Reliance cannot be placed on natural ventilation; efficient local exhaust ventilation, as near as possible to the source of the hazard, is essential. Following a study of health hazards in chromium plating, the United States public health service recommends drawing the air laterally across the top of the plating tanks into ducts from 1 to 2 inches wide and extending fully along one or more sides of the tanks as the most efficient method of ventilation. To be effective, the duct should not be required to draw the air laterally for a distance of more than 18 inches. The report further recommends that the level of the plating solution should be at least 8 inches below the top of the tank and the duct should be at the top of the tank. For effective ventilation, it is necessary to have an air velocity at the duct of about 2000 feet per minute.

$ $ $

In cast form, steels containing 30 to 35 per cent nickel and 15 to 20 per cent chromium have shown some remarkable properties. It is generally recognized that such compositions probably are the strongest known at extremely high temperatures.

$ $ $

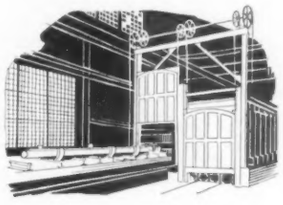
REMOVING tool marks from granite monuments and grave stones is a job which can be performed successfully with the oxyacetylene welding torch. After demonstrating the use of this apparatus in removing some 30 marks from the sides of a granite monument, a welding equipment salesman experienced no difficulty in obtaining an order for a special outfit and supplies of oxygen and acetylene from an eastern stone cutter. The work was done by using the proper welding tip and holding the flame about 6 inches from the stone, a distance which gave best results. A hand chisel or wire brush was used to finish the job. It is said that this method of tool mark removal is very successful on black granite stone which does not fly like concrete.

$ $ $

For several years, automobile drivers in Michigan have been protected from the annoyance of their license plates rusting. The plates, made of steel, are given a rust-proofing treatment which not only protects the metal but provides a base for the enamel.

$ $ $

Among notable applications of plain chromium steels containing from 18 to 30 per cent and even higher amounts of the element are supporting disks in furnaces for normalizing sheet steel and for parts of waste heat recuperators. Seamless tubes have



greatly widened the use of these higher chromium steels. Such tubes now are being employed for soot blowers in power plant installations and as superheaters operating at high temperatures. Investigation also has indicated that seamless tubes containing over 20 per cent chromium can be utilized economically as muffles in furnaces for heat treating wire.

$ $ $

Tungsten carbide is used advantageously in nozzles delivering abrasive materials. For example, a manufacturer of coated welding rod found it difficult to coat the wire uniformly until he placed a tungsten carbide insert in the coating die. In coating 5/32-inch wire, high-speed steel dies showed average wear of 0.001 inch in hole diameter for every 1500 feet of welding rod. With the insert of tungsten carbide in the die, 180,000 feet of wire is coated for each 0.001 inch increase in size of die hole. Use of the tungsten carbide has resulted in lower die costs, less maintenance expense and a more uniform product.

$ $ $

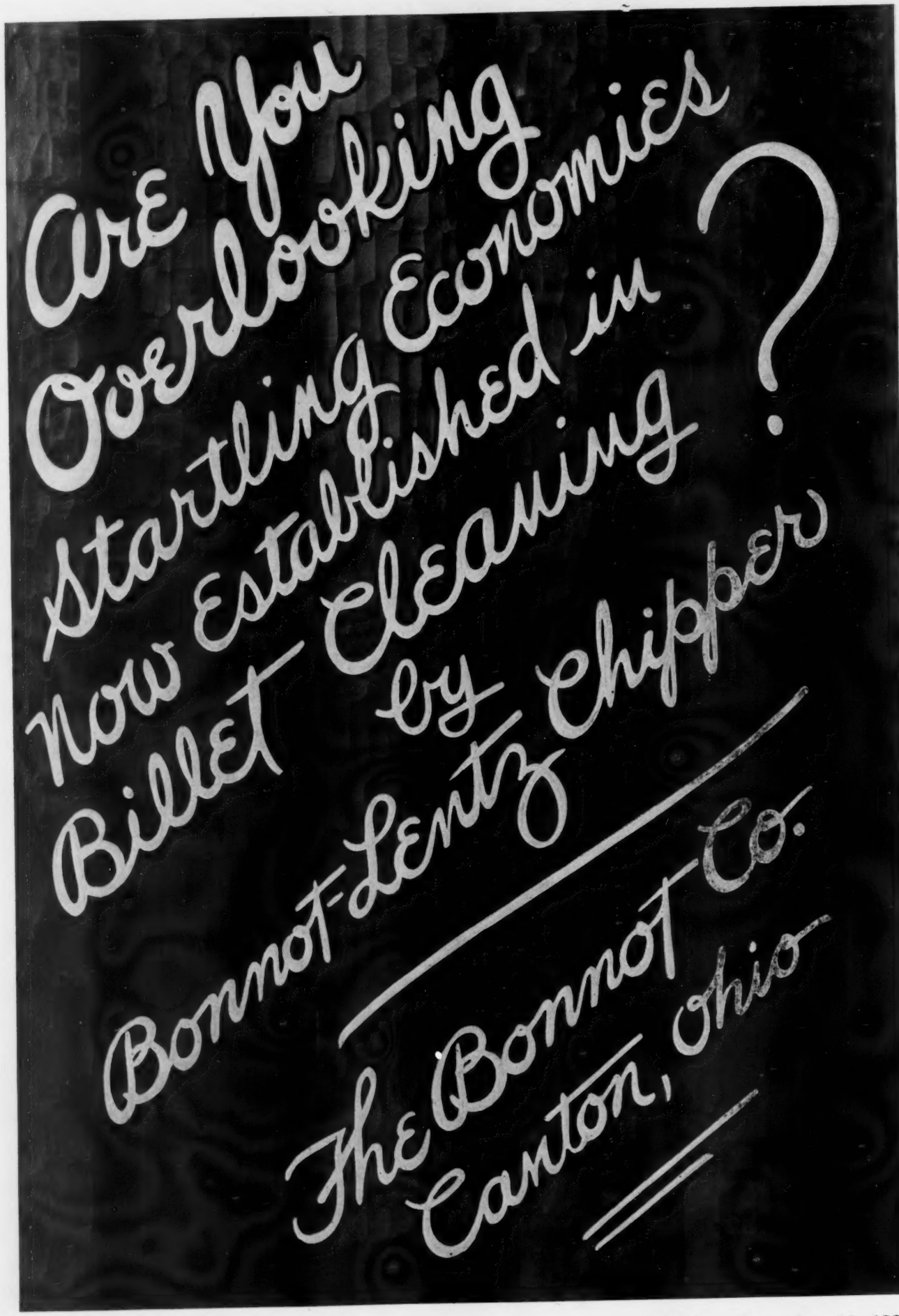
IN THE smaller sizes, 18-8 chrome-nickel corrosion-resisting steel wire can be had with a tensile strength of 250,000 to 300,000 pounds per square inch. Even much higher strengths are obtainable but are not advisable except for specific requirements where consideration may be given to all factors involved in the expected service.

$ $ $

Two years ago a lumber company budgeted $2000 for new saws, but before it was spent the company investigated oxyacetylene welding. Saw repairing by the blowpipe was demonstrated and now all saws with broken teeth, cracks, or otherwise damaged, are restored by welding under exact procedure control. No expenditures have been made for new saws.

$ $ $

A sand and gravel pit operator called upon welding experts for assistance in reclaiming a stone crusher spider weighing about 8 tons. The spider was made of cast iron and was worn on one side only. By strengthening this side and turning the casting so that the stones would come in at the opposite side, it could be put back in service. This would save the company $1400, the purchase price of a new spider. The job was performed by putting a patch over the worn section, extending the patch about 12 inches beyond to transfer the strain to a heavier part of the spider. The patch was made of 1¼-inch plate and weighed about 400 pounds. After forming it to the shape of the spider, it was anchored in place by eight 1½-inch studs. The patch was attached to the casting by bronze welding, the job being preheated with gasoline blow torches and kept hot while welding progressed. Approximately 12 feet of welding, 80 pounds of bronze, 3 pounds of flux, 990 cubic feet of oxygen, 870 cubic feet of acetylene and 14 man-hours of actual welding time were required to complete the job.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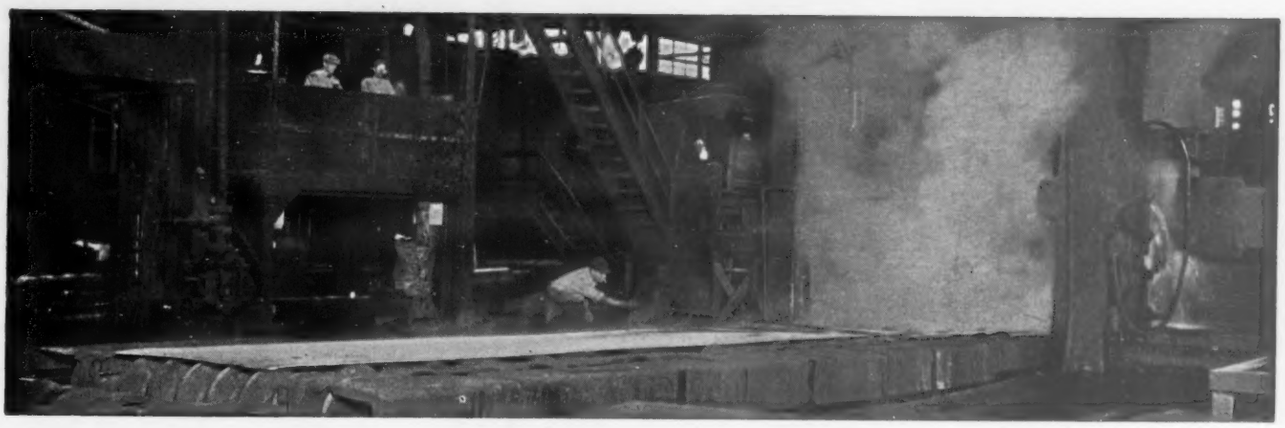


PROGRESS IN STEELMAKING

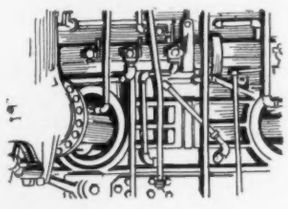
OVERALL costs of annealing strip steel in bell-type electric annealing furnaces at one plant amounts to $3.05 per ton compared to $5.71 for pot annealing. This represents an annual saving of $9000.

♦ ♦ ♦

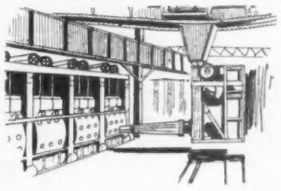
Experimental work by one of the leading tubemakers in Germany has resulted in the development of a machine employing the Mannesmann principle and using four obliquely mounted rolls, 3½ inches diameter, with a body length of 5 inches. The rolls are driven. The shaft of the 400-horsepower motor was bored out to permit the insertion of the mandrel. With the machine a blank about 0.2-inch x 2.67 inches was drawn into a tube 2.3 inches diameter with a wall thickness of 0.074-inch having smooth, clean inner and outer surfaces.

♦ ♦ ♦

Stabilized deep drawing steel is of recent development. The new material in the dead soft state will stretcher strain the same as ordinary mild steel, but this is prevented by small amounts of temper cold rolling and does not recur even after aging as long as a year at room temperature or 14 days at 212 degrees Fahr.



ALTHOUGH some blast furnace operators claim that about 112 degrees Fahr. is the ideal temperature of the discharge water from tuyeres, yet experiments indicate that aluminum tuyeres cannot be damaged even with a temperature of 140 degrees Fahr., provided no superheating occurs. When the feed water to the tuyeres was reduced to 12 pounds per square inch the temperature of the discharge water registered about 140 degrees. This condition was maintained for 30 days without the failure of a single aluminum tuyere. The tests disclosed that the most important factor in the prevention of damage to tuyeres is the control of the velocity of the blast.



UNIFORMITY of temperature in a slab heating furnace serving a continuous strip mill in the Chicago district is afforded by a new system of burning gasified heavy oil. By this arrangement drops of heavy fuel oil are prevented from falling on the surface of the slabs and thus cause oil pits.

♦ ♦ ♦

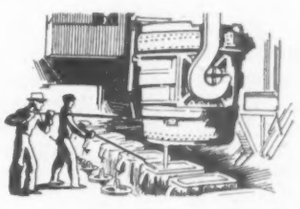
One of the features of a newly designed bending roll for forming plates up to 35 feet long ready for welding into pipe is that it will prebend the ends of a plate to the desired radius, thus obviating the need of auxiliary equipment. In performing this initial operation, the plate end progresses into the machine until it strikes a stop gage which is withdrawn mechanically before rolling of the pipe begins. Since more pressure is required to prebend the plate ends than to round the section, each of the three main bending rolls are positively driven and supported by adjustable backup rolls. The latter serving the top bending roll are mounted in a housing which is swung away mechanically after the plate ends have been crimped, thus affording complete rounding of the pipe without interference. The upper roll is tilted and its end bearing opened simultaneously by power to permit the cylinder to be withdrawn. Compensation for any spring in the rolls is effected by a correctional device, thus obviating any "fish-shaped" product. A large scale, which indicates the proper roll settings for pipe of various diameters, is provided. The machine is controlled from a pulpit which enables the operator to view the work at all times.

♦ ♦ ♦

Detection of flaws and cracks in tungsten and molybdenum wire has been made possible by the development of a vacuum tube oscillator.

♦ ♦ ♦

Clearance of ordinary commercial bearings on steel mill equipment has been found satisfactory when maintained at about 0.0013-inch per inch diameter for speeds less than 1800 revolutions per minute, according to an authority on bearing design. Vertical clearance is somewhat smaller for units operating at 3600 revolutions per minute.



RELIABLE mixtures for stopper plugs on open-hearth ladles can be made in the steel plant from used graphite stoppers, finely ground, and high-bonding fire clay. The two commodities are mixed in the ratio of two-thirds ground stoppers and one-third fire clay.

SCANNING THE FIELD OF TECHNOLOGY

A Digest of Important Developments Pertaining to the Production, Processing, Application and Performance of Steel

Fatigue and Hardening

By H. J. French, in Transactions of the American Society for Steel Treating, October, p. 899, 48 pp., 23 ills., 14 tables; eighth Campbell Memorial Lecture, presented at the recent meeting of the society in Detroit.

This work comprises an appraisal of the processes of martensitization and age hardening of steels, given in terms of the resistance of the materials to fatigue. Delayed fractures (after 10,000,000 stress repetitions) in martensitized steels are discussed in relation to fatigue testing technique and the utilization of hardened and slightly tempered steels. Methods are given for determining "probable damage lines," that is, the ranges of overstress within which damage should not occur.

—STEEL, 11-20-33

Corrosion Fatigue

By F. N. Speller and I. B. McCorkle, in a paper presented at the annual meeting of the American Petroleum institute in Chicago recently; preprinted, 5 pp., 2 ills., 2 tables.

Discussion of the general problem of corrosion fatigue of steels used in oil well drilling practice, and a description of materials and method of procedure employed to determine the effect of various organic coatings in preventing damage to the metal when subjected to a combination of stress and corrosion. Experimental data available at present are limited, but indicate that a considerable amount of protection may be expected from the use of suitable coating materials.

—STEEL, 11-20-33

Cold Forming

By A. E. R. Peterka, in Metal Progress, October, p. 35, 4 pp., 2 ills.

Cold heading or upsetting and cold punching the stainless steels in the manufacture of small-size screws, bolts and nuts. Selection of material, heat treatment, roll threading, passivating, handling and inspection are considered.

—STEEL, 11-20-33

Fatigue Study

By R. L. Scorah, in Machine Design, November, p. 31, 3 pp., 4 ills., 2 tables.

Measurement of localized stresses in metals by means of fatigue tests, the method consisting of comparing the endurance limit stress of a specimen whose shape omits all "stress-raising" details, with the apparent endurance limit stress of a specimen whose shape contains the stress-raising detail that it is desired to investigate. Ratio between the former endurance limit stress and the latter is termed the stress concentration factor. Results of such tests on S.A.E. 3325 steel are presented, as well as additional tests on S.A.E. 1045 and 1025 steels, all in the form of hot-rolled ⅞-inch diameter bars.

—STEEL, 11-20-33

Tool and Die Costs

By J. R. Weaver, in Machinery, November, p. 129, 4 pp., 5 ills.

Discussion of a low melting point alloy known as "matrix alloy," containing bismuth, lead, tin and antimony. It is used as a means of accurately locating working surfaces and members of a tool or die relative to each other without the need of machining nonworking surfaces to close dimensions. The alloy is poured into spaces that have been provided between the various parts that make up the die or other tool. Use of the alloy is claimed to have facilitated die assemblies and thereby lowered costs.

—STEEL, 11-20-33

Gas Carburizing

By R. J. Cowan, in Metal Progress, October, p. 44, 5 pp., 5 ills.

Survey of recent progress in the field of gas carburizing. Mention is made of difficulties encountered with certain alloy trays which slowed up the carburizing reaction. Copper plating overcame the trouble, and later new alloys were developed which gave satisfactory results. Methods of obtaining a high-carbon case on the work are outlined, centering around changes in composition of the carburizing gas.

—STEEL, 11-20-33

Spalling Tests

By Fred A. Harvey, in bulletin No. 42 of the American Refractories institute, September, 7 pp., 2 ills., 3 tables.

Data in support of the panel spelling test for determining behavior of refractories in service. In the panel test, brick are built into a suitable panel, about 18 x 18 inches, this unit being preheated and then subjected to alternate high heating and cooling. Brick are then removed and examined to note effects of the treatment.

—STEEL, 11-20-33

Flame Cutting

Oxy-Acetylene Tips, November, p. 249, 3 pp., 6 ills.

A review of recent investigations on the subject of the effects of flame cutting on steel. Preheating is advisable when high-carbon and alloy steels are to be cut. Parts that are to undergo high repeated or reversing stresses on an exposed cut surface can be cut satisfactorily provided apparatus is set up to insure a precision cut with no indentations.

—STEEL, 11-20-33

Cleaning Castings

The Foundry, November, p. 16, 3½ pp., 5 ills.

Description of improved equipment for cleaning steel castings as they are taken from the shakeout floor. Water under pressures ranging from 300 to 400 pounds is used as a cleaning medium, the work being carried out in a special steel washing unit, 25 feet square and over 17 feet high.

—STEEL, 11-20-33

Better Light

By Dean M. Warren ,in Machinery, November, p. 133, 1 p., 2 ills.

Citing results of recent laboratory study which indicated that by raising the level of illumination from 3 to 12 foot-candles, increases from 14 to 40 per cent were obtained in the rate of work from various workers.

—STEEL, 11-20-33

Cupola Refractories

By C. E. Bales, in technical bulletin No. 43 of the American Refractories institute, October, 7 pp., 3 ills.

Review of various methods used in forming cupola blocks, factors determining the life of cupola linings, means of obtaining longer service from linings, and daubing materials.

—STEEL, 11-20-33

Die Hardening

Electrical Production, November, p. 9, 2½ pp., 3 ills.

Use of electric heat in the hardening of pipe-fitting dies. Hump furnace and electrically heated lead pot are used for heating; electric salt pot is used for drawing.

—STEEL, 11-20-33

Alloy steel and iron bear the brunt

The past decade's revolutionary advance in the application of high speeds, high pressures, and high temperatures to mechanical production and chemical processes has necessitated the working out of a tremendous number of alloy steel and iron analyses, each designed to meet some specific requirement of this new age.

High strength at high temperature . . . high strength combined with light weight . . . complete resistance to corrosion under varying conditions . . . increased wear resistance . . . immunity from the effects of shock and fatigue . . . these are but a few of the manifold demands that are met daily by the proper use of Ferro-Alloys.

Any metal part used in your product or equipment can be benefited by some one or more of the inherent advantages of Ferro-Alloys. It will pay you to investigate thoroughly the latest developments in high temperature metallurgy and to let Electromet Engineers explain how required physical and chemical properties may be provided by the use of Ferro-Alloys.

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Safety Is Embodied in Oxygen-Acetylene Tank Truck

Lorain Steel Co., Johnstown, Pa., a subsidiary of the United States Steel Corp., is manufacturing and marketing a new hand truck for gas welding and cutting equipment, embodying unusual safety features. Truck, shown herewith, was designed, and patent has been applied for, by C. W. Meyers of the development department of American Steel & Wire Co.

Meyers safety truck for transporting oxygen-acetylene tanks

Safety features embodied in this truck are: A hook-eye at top of truck to permit transportation by crane where necessary, and another auxiliary hook-eye at bottom front end; built-in heavy asbestos board fire screen between tanks; hose hook; large sized wheels with double roller bearings and solid rubber tires; resilient rubber pad mounting between bottom plates; well braced frame; tool box with locking provision; fire extinguisher holder; fabric-lined tank clamps with latches, and a safety continuous handle. The truck is fabricated mainly from steel angles and pipe, with welded joints, making for an unusually compact, distortion-resisting unit.

◆

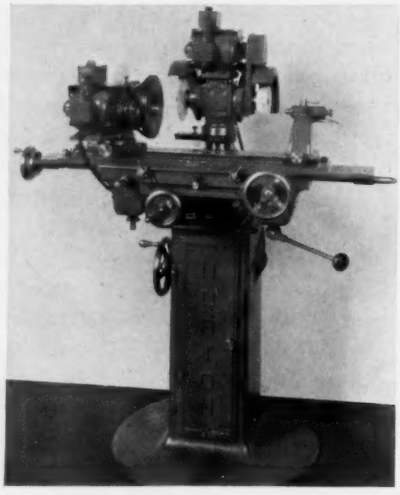
High Power, Light Weight Feature Blower

Breuer Electric Mfg. Co., 852 Blackhawk street, Chicago, has developed a new portable electric blower, designated model 10, for blowing dust out of motors and machines, and parts of all kinds, vacuum cleaning bins, stock rooms or space that collects dust or dirt, and for spraying. Tremendous power in small space and with light weight is an outstanding feature of this new blower, providing an even wider range of usefulness. A 1 horsepower motor is combined with a specially designed fan to give 46½-inch water lift.

◆

Tool and Cutter Grinder Is Arranged Conveniently

Norton Co., Worcester, Mass., recently brought out a new tool and cutter grinder designated No. 1. The wheel drive motor of this unit, shown herewith, is mounted directly on the wheel head. V-belts are employed. The wheel spindle is of the cartridge type; wheel head is graduated horizontally and swivels through 360 degrees.



Norton tool and cutter grinder has cartridge-type wheel spindle

A particular feature of this machine is its convenient arrangement. The base is a sturdy box casting of such size that the operator can straddle it while grinding. In addition a duplex feature permits operation from either front or back since the various handwheels and levers can be mounted at one or both ends and either in front or back or both. The machine is supplied with one set of handwheels and levers which can be transferred to corresponding positions on the opposite side.

Supplied with the machine is a universal work head which can be clamped to the table. It is graduated and will swivel 360 degrees horizontally and 200 degrees vertically. The spindle will take either national standard milling cutter shanks or No. 12, 10, 9 or 7 B. & S. tapers. The head mounts either a three-jaw or face chuck and provision is made for attaching a driving motor in a few minutes when it is used as a headstock. In addition to the horizontal and vertical graduations a separate set of graduations is provided for use when setting clearance angles. A left-hand footstock can be supplied instead of the universal work head if the latter is not required.

◆

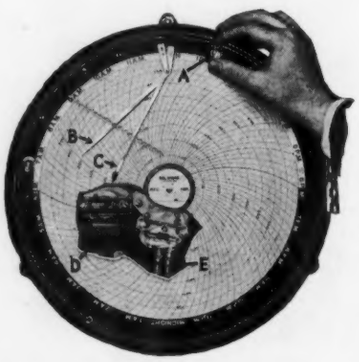
Balanced Roll Is Employed In New Line of Belt Idlers

Jeffrey Mfg. Co., Columbus, O., has placed on the market a line of belt idlers for universal application. Outer shells of the rolls are made of steel tubing, into which steel ends are centered and electric welded to form a one-piece balanced roll. Welded ends of the rolls are machine rounded to provide protection against injury to the belt. All bearings are guarded from dirt by a double labyrinth grease seal. Pulleys can be removed by simply lifting them from the stands or hangers.

◆

Automatic Controller Unit Maintains Temperature

Brown Instrument Co., Philadelphia, has developed a new automatic control thermometer on which mercury switches are employed to eliminate open-make-and-break contacts. In this controller, shown herewith, a motor-driven control table determines the location of the pen on the chart in reference to the control setting every six seconds, and tilts the mercury



New Brown mercury switch thermometer controller

ADVERTISING PAGES REMOVED

switch from one side to the other if the temperature has changed. This control mechanism is adaptable to one, two or three-contact (or signalling) systems. In a two-record controller each control mechanism can control a separate device, each may be used independently of the other, and each has its own control index.

The unit also is supplied as a time-temperature cycle controller.

◆

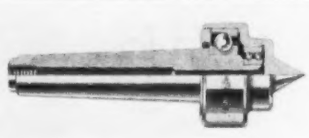
Blades of New Steel Rules Are Both Rigid and Flexible

Stanley Works, New Britain, Conn., recently brought out three new "Pull-Push" rules. The 6-foot steel blades are both rigid and flexible. Rigidity facilitates measuring straight, horizontally or vertically. The flexibility adapts it for measuring cylinders and odd shapes. These rules are so constructed that the blade can be removed entirely from its case and used for end to end measurements. Other features include nickel plated blades; safe "pull-push" blade action; graduations that lie close to work; watch size cases, only 2 inches in diameter.

◆

Develops New Heavy-Duty Type Live Center

Sturdimatic Tool Co., 5220 Third street, Detroit, recently designed a heavy-duty live center, shown herewith. It is characterized by its sturdiness, free and easy rotation, automatic compensation for expansion, shock and



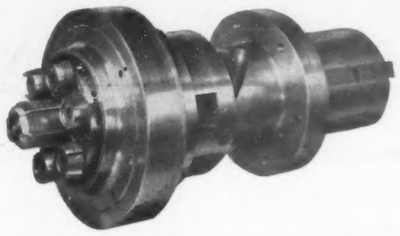
Heavy-duty live center designed by Sturdimatic Tool Co.

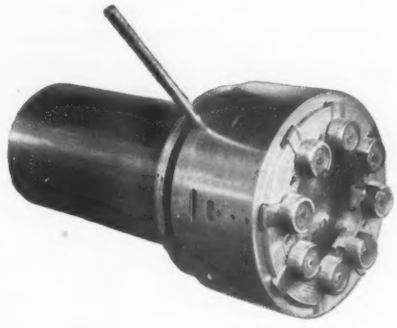
wear, accuracy, durability, etc. The radial bearing is mounted as close to the work as possible to reduce the overhang. Thrust load passes through the nose and rotor housing. A slight cushion action is obtained which protects the bearings from a thrust overload due to expansion of the work produced by heat. Lubricant is forced through the channel in the center of the shank into the rotor chamber.

◆

Circular Chaser Cutting Tools Meet New Standards

National Acme Co., 170 East 131 street, Cleveland, recently introduced a complete line of circular chaser receding taps from 4 to 13⅜-inch, and a series of expanding dies also employing circular chasers from 1 to 13⅜-inch, both types shown herewith. These tools have been designed to provide a higher degree of accuracy in cutting taper threads on pipe and





Above—National Acme circular chaser collapsible tap, receding type. Below—Circular chaser self-opening die head, expanding type

tubing. Larger sizes can be made on specification. The fundamental idea of the circular chaser, which resembles a circular forming tool, is to present a large amount of steel back of the cutting edge, so as to carry away cutting heat, and afford rigid support to the cutting edge.

The chasers are ground on the form and mounted rigidly on a massive steel block, being inclined on the surface of the block in such a way that the successive chasers describe a perfect helix on the pipe. By means of a serrated bushing, on which the chasers are mounted, they can be advanced for grinding when the cutting edge is dull. Chasers of a certain pitch may be used on a wide range of diameters.

In the construction of the die head, the chaser block is held firmly against a hardened ground gib, supported in the outer case of the die head. It is possible by replacing these gibs to change the die head for a different taper. An inside adjustable trip mechanism operating on ball bearings permits adjustment to proper length of threaded section. The tools are designed for use in any commercial type horizontal or vertical machine.

◆

Introduces Oil-Resisting, Heat-Resisting Cable

General Electric Co., Schenectady, N. Y., has developed a new cable insulated with Glyptal-treated cloth and capable of resisting oil and withstanding high temperatures. In addition this new cable is characterized by unusual flexibility and toughness that enables it to withstand severe mechanical strain. The insulating material known as Glyptal is a synthetic resin, produced from phthalic anhydride and glycerine, which is unaffected by mineral oil. Samples of cable insulated with cloth treated with this material have been exposed to temperatures of 100 degrees Cent. for periods of three to four months without showing appreciable deterioration.

◆

Precision Ball Bearings Are Small in Size

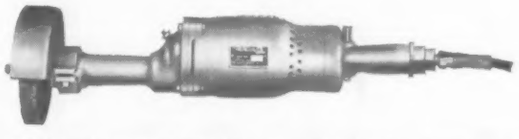
Norma-Hoffmann Bearings Corp., Stamford, Conn., now includes in its standard line two bearings of diminutive size. These are designated N-463 with ⅛-inch bore and ⅜-inch outside diameter, and the 4666 having a 3/16-inch bore and ½-inch outside diameter. These units contain 12 and 17 balls, respectively.

◆

Builds High-Frequency Grinder In Two Different Speeds

Buckeye Portable Tool Co., Dayton, O., has placed on the market new high-frequency No. 61 grinder built in two speeds, 3800 revolutions per minute for use with 6-inch vitrified emery wheels, and 5400 revolutions per minute for use with 6-inch elastic bonded emery wheels. The 3800 tool also can be used with 8-inch elastic bonded wheels.

Outstanding features of these tools, shown herewith, are the cool running motor, streamline ventilation system and mounting of the stator on insulating pads within the motor housing. The plug-in cable is another improvement, as it makes it possible to change cables on the job.



High-frequency portable electric grinder developed by Buckeye Portable Tool Co.

TOUGH
by any test

● If toughness after heat treatment is a vital requirement in your steel, then Carnegie Controlled Carbon Steels warrant your investigation. Through positive control of quality factors in their manufacture, the scope of these steels in all carbon ranges now includes many uses heretofore requiring higher priced alloys. One user reports that he has not only reduced his steel costs but in addition has cut his processing costs 11%.

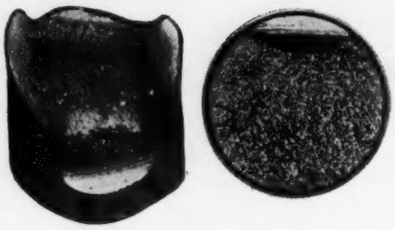
Let our metallurgists help you to determine the grade and character of steel best suited to your purpose. Once this has been developed, you may be sure that every succeeding heat will respond to your process in an equally satisfactory manner. This is accomplished through scientific control of metallurgical practice, including control of austenitic grain size heretofore believed by many as impossible in basic open hearth steels.

The booklet "Carnegie Controlled Carbon Steels" will be sent you upon request.

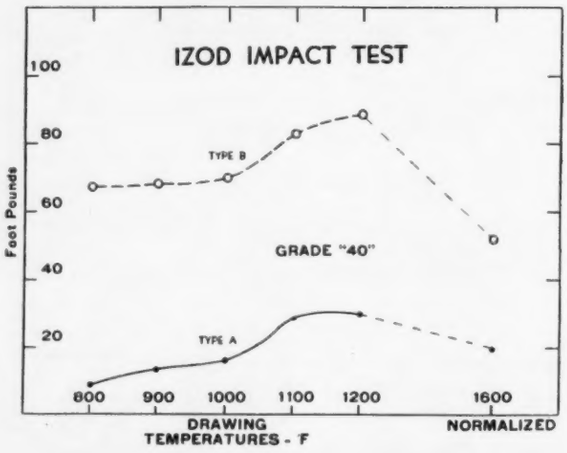
DISTORTION TEST

TYPE B TYPE A

These tests compare two .40 carbon steels of same analysis and identical treatments.



FRACTURE TEST



ENDURANCE LIMIT—R. R. Moore machine in air,
Grade .50 Type A 66,500 pounds per square inch
Type B 71,000 pounds per square inch

CARNEGIE STEEL COMPANY • PITTSBURGH

240 Subsidiary of United States Steel Corporation

CARNEGIE
Controlled
CARBON STEELS

Sentiment Stronger, Despite Seasonal Restraint

Heavier Structural Tonnages Developing—Railroads Free To Place Own Orders, Begin Buying—Automotive Requirements Lift Operations—Few Price Changes

DESPITE handicaps of the seasonal trend in iron and steel, which normally is downward during late November and December, sentiment in the industry is lifted and supported by broadening interest in structural material, further progress with the railroad program, prospects for automotive buying, and reappearance of larger miscellaneous requirements.

Steelmakers believe that before the first of the year there will be a substantial revival in buying, if not in actual production of steel. Opinion is more general that if inflation does not stimulate conversion of money into commodities, including steel, stabilization of the dollar should restore confidence by eliminating many uncertain factors. Also, it is logical to expect the lower value of the dollar in the world markets to increase attractiveness of American manufactured products abroad.

In the automobile industry, steel consumption is over the low point of the year. Inventories at Detroit militate against volume purchasing, though steelworks operations for the past week expanded 4 points to 28 per cent, mainly by releases for a number of lines whose full requirements could not be anticipated.

Government Decides Not To Allocate Orders; Rail Purchasing Picks Up; Shapes Heavier

The government's decision not to allocate 844,000 tons of rails on which it procured bids, but to permit railroads to buy direct, is of prime importance to the mills, as it gives the railroads the opportunity to place their own orders, whereas government purchasing would have been at mills nearest to basing points. Freedom also is granted the carriers to buy 245,000 tons of track fastenings where they choose, the government deciding not to take bids.

Clarification of these points, which tended to retard action by the railroads, is now expected to expedite releases. The Chicago & North Western is placing 65,000 tons, Louisville & Nashville 17,500 tons, Atlantic Coast Line 5000 tons, Missouri-Kansas-Texas 4700 tons; while Chicago, Rock Island & Pacific is seeking court sanction to purchase 35,000 tons.

In structural work, the cumulative effect of public projects is more noticeable. Structural shape awards for the week increased to 28,092 tons. For three projects in New York, 33,000 tons are about to be placed.

The government also has decided to try the experiment of bridging the Atlantic with seadromes. Its $1,500,000 appropriation for a quarter section of one unit insures early release of 6000 tons of steel; and if successful, 125,000 tons ultimately to complete the project.

The navy is buying 16,000 tons of plates for two cruisers and two gunboats. San Francisco has approved public work immediately requiring 47,000 tons of iron and steel pipe. An inquiry for 20,000 tons of pipe for Russia is considered tempting bait for trade negotiations.

Price Advances on Relatively Few Products; Pig Iron Stocks Increasing; Scrap Held Down

Bids are being taken on the first oil pipe line to appear in many months, a Socony-Vacuum Corp. affiliate to lay 50 miles in Kansas, taking 2500 tons.

Extension of the steel code to May 31 is sought on expiration of the 90-day trial period. On Monday new prices must be filed if they are to become effective Dec. 1 for first quarter sales.

Steel producers, however, apparently are less concerned over higher prices than in getting volume to make present levels remunerative. In the heavy finished products, including plates, shapes and bars, no changes are anticipated. Wire rods, tin plate, nails, boiler tubes, and possibly billets are among the few products likely to be advanced. Some eastern pig iron producers are contemplating an increase.

Pig iron shipments are increasing, as consumers are specifying to get in all the material due them, much of it at lower prices than now prevailing. At the same time, melters are trying to hold down year-end inventories of scrap.

Steelworks operations last week advanced 11 points to 32 per cent at Buffalo, 10 to 31 at Youngstown, 8 to 45 at Detroit, and 8 to 46 at Wheeling. They were unchanged at 46 at Cleveland, 29 at Chicago, and 20 at Birmingham, and reduced 2 points to 21 at Pittsburgh, 5 to 70 in New England, and 1 to 17½ in eastern Pennsylvania.

STEEL's iron and steel composite remains $31.59; finished steel, $49.20; while the scrap composite is off 4 cents to $9.58.

COMPOSITE MARKET AVERAGES

	Nov. 18	Nov. 11	One Month Ago Oct., 1933	Three Months Ago Aug., 1933	One Year Ago Nov., 1932	Ten Years Ago Nov., 1923
Iron and Steel Composite	$31.59	$31.59	$31.59	$30.04	$29.12	$42.81
Finished Steel Composite	49.20	49.20	49.20	47.50	47.20	67.48
Steelworks Scrap Composite	9.58	9.62	10.37	11.57	6.87	14.05

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	Nov. 18, 1933	Oct. 1933	Aug. 1933	Nov. 1932
Finished Material				
Steel bars, Pittsburgh	1.75	1.75	1.60	1.60
Steel bars, Chicago	1.80	1.80	1.70	1.70
Steel bars, Philadelphia	2.04	2.04	1.91	1.91
Iron bars, Chicago	1.60	1.60	1.65	1.65
Shapes, Pittsburgh	1.70	1.70	1.60	1.60
Shapes, Philadelphia	1.90	1.90½	1.81½	1.75
Shapes, Chicago	1.75	1.75	1.70	1.70
Tank plates, Pittsburgh	1.70	1.70	1.60	1.60
Tank plates, Philadelphia	1.88	1.88½	1.79½	1.69½
Tank plates, Chicago	1.75	1.75	1.70	1.70
Sheets, No. 10, blue anneal., Pitts.	1.75	1.75	1.65	1.70
Sheets, No. 24, hot ann., Pitts.	2.25	2.25	2.25	2.10
Sheets, No. 24, galvan., Pitts.	2.85	2.85	2.85	2.85
Sheets, No. 10, blue anneal., Gary	1.85	1.85	1.75	1.80
Sheets, No. 24, hot ann., Gary	2.35	2.35	2.40	2.25
Sheets, No. 24, galvan., Gary	2.95	2.95	3.00	2.90
Plain wire, Pittsburgh	2.10	2.10	2.10	2.20
Wire nails, Pittsburgh	2.10	2.10	2.10	1.95
Tin plate, per base box, Pitts.	4.65	4.65	4.25	4.50
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	26.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	26.00
Wire rods, Pittsburgh	35.00	35.00	35.00	37.00

	Nov. 18, 1933	Oct. 1933	Aug. 1933	Nov. 1932
Pig Iron				
Bessemer, del. Pittsburgh	19.26	19.26	18.26	15.76
Basic, valley	17.00	17.00	16.00	14.00
Basic, eastern, del. eastern Pa.	17.76	17.76	17.20	13.50
No. 2 foundry, del. Pittsburgh	18.76	18.76	17.76	15.76
No. 2 foundry, Chicago	17.50	17.50	17.00	15.50
Southern No. 2, Birmingham	13.50	13.50	13.00	11.00
No. 2X, Eastern, del. Phila.	18.63	18.63	17.88	13.95
Malleable, valley	17.50	17.50	16.50	14.50
Malleable, Chicago	17.50	17.50	17.00	15.50
Lake Superior charcoal, del. Chi.	23.54	23.54	23.04	23.04
Gray forge, del. Pittsburgh	18.38	18.38	17.13	15.63
Ferromanganese, del. Pittsburgh	87.24	87.24	87.24	73.24
Scrap				
Heavy melting steel, Pittsburgh	$11.50	12.45	13.75	9.15
Heavy melting steel, eastern Pa.	9.50	10.19	12.00	7.25
Heavy melting steel, Chicago	8.25	9.35	10.40	5.60
No. 1 wrought, eastern Pa.	10.00	10.75	13.00	7.25
No. 1 wrought, Chicago	8.10	9.10	10.35	5.60
Rails for rolling, Chicago	10.25	11.10	11.25	8.25
Coke				
Connellsville, furnace, ovens	3.75	3.25	2.75	1.80
Connellsville, foundry, ovens	4.25	3.85	3.10	2.65

Steel, Iron, Raw Material and Metals Prices

Prices conform to American Iron and Steel institute schedules. Asterisk denotes price change this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.75c
Gary, base	1.85c
Chicago, del.	1.88½c
New York, del.	2.08c
Phila., del.	2.04c
Birm., base	1.90c
St. Louis, del.	2.07c

HOT ROLLED ANN. No. 10

Pittsburgh, base	1.90c
Gary, base	2.00c
Chicago, del.	2.03½c
Phila., del.	2.19c
New York, del.	2.23c
St. Louis, del.	1.97c
Birm., base	2.05c
F.o.b. cars, dock Pacific ports	2.42½c

HOT ROLLED ANN. No. 24

Pittsburgh, base	2.25c
Gary, base	2.35c
Chicago, del.	2.38½c
Detroit, delivered	2.45c
New York, del.	2.58c
Phila., del.	2.54c
Birm., base	2.40c
St. Louis, del.	2.57c
F.o.b. cars, dock, Pacific ports	2.95c

GALVANIZED No. 24

Pittsburgh, base	2.85c
Gary, base	2.95c
Chicago, del.	2.98½c
Phila., del.	3.14c
New York, del.	3.18c
Birm., base	3.00c
St. Louis, del.	3.17c
San Fran., f.o.b. cars, dock	3.55c

TIN MILL BLACK No. 28

Pittsburgh, base	2.50c
Gary, base	2.60c
St. Louis, del.	2.82c

COLD ROLLED No. 10

Pittsburgh, base	2.30c
Detroit, delivered	2.50c
Gary, base	2.40c
Philadelphia, del.	2.59c
New York, del.	2.63c

COLD ROLLED No. 20

Pittsburgh, base	2.75c
Detroit, delivered	1.90c
Gary, base	2.85c
Philadelphia, del.	3.04c
New York, del.	3.08c

ENAMELING SHEETS

Pitts., No. 10	2.45c
Pitts., No. 20	2.90c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh
Gary base, 10 cents higher.

Tin plate, coke base, contract	$4.65
Do., stock	4.05
Long ternes, No. 24 unassorted	2.90c

Corrosion and Heat Resistant Alloys

Base, Pittsburgh
18% chrome, 8% nickel: sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	17c	18.5c	21c	26c
Plates	20c	21.5c	24c	29c
Sheets	25c	28c	31c	35c
Hot Strip	17c	18.5c	21c	26c
Cold Strip	22.5c	24c	27c	35c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.70c
New York, del.	1.98c
Phila., del.	1.88½c
Boston, del.	2.10c
Buffalo, del.	1.93½c
Chicago, base	1.75c
Cleveland, del.	1.88½c
Birm., base	1.85c
Coatesville, base	1.80c
Sparrows Pt., base	1.80c
Pac. Coast, f.o.b.	
St. Louis, del.	1.97c
cars, dock	2.25c

Structural Shapes

Pittsburgh, base	1.70c
Philadelphia, del.	1.90½c
New York, del.	1.95½c
Boston, del.	2.08½c
Bethlehem, base	1.80c
Chicago, base	1.75c
Cleveland, del.	1.88½c
Buffalo, base	1.80c
Birm., base	1.85c
Pac. Coast, f.o.b. cars, dock	2.25c

Bars

SOFT STEEL

Pittsburgh, base	1.75c
Chicago, base	1.80c
Birm., base	1.90c
Buffalo, base	1.85c
Cleveland, base	1.80c
Detroit, delivered	1.90c
Pac. Coast ports, cars, dock, c.i.f.	2.30c
Philadelphia, del.	2.04c
Boston, del.	2.19c
New York, del.	2.08c
Pitts., forg. qual.	1.75c-2.25c

RAIL STEEL
To Manufacturing Trade

Pittsburgh	1.65c
Chicago	1.70c
Cleveland	1.70c
Gary, Ind.	1.70c
Buffalo	1.75c

IRON

Chicago, base	1.60c
Philadelphia, base	1.74c
Pitts., refined	2.75c-7.50c

REINFORCING
New billet, mill lengths, carlots

Pittsburgh	1.80c
Chicago, Gary, Buffalo, Cleve., Birm., Young	1.85c
Gulf ports	2.20c
Pacific coast ports	2.35c
Philadelphia, del.	2.09c

Rail steel

Pittsburgh, base	1.75c
Chicago, Buffalo, Cleveland, Birm., Young	1.80c
Gulf ports	2.15c
Pacific coast ports	2.30c

Wire Products □ □

(Prices on carloads. Mixed carloads up 10c; joint carloads up 20c; less carloads up 30c. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pittsburgh-Cleveland
(Per 100-lb. keg)

Standard wire nails	$2.10
Cement coated nails	2.10
Galvanized nails	3.60

(Per pound)

Polished staples	2.80c
Galvanized fence staples	3.05c
Barbed wire, gal.	2.60c
Annealed fence wire	2.25c
Galvanized fence wire	2.60c
Woven wire fencing (base column, c.l.)	$55.00
Plain wire, 6-9 gage to mfg. trade	2.10c

Anderson, Ind., Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire	3.10c

Chicago and Waukegan $1 higher, Worcester $2 higher.

Cold-Finished Carbon Bars

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	1.95c
20,000 to 59,999 lbs.	1.90c
60,000 to 99,999 lbs.	1.85c
100,000 lbs. and over	1.82½c

Chicago, Cleveland, Buffalo up 5c; Detroit up 20c; eastern Michigan up 25c.

Shafting □ □ □

Turned and ground, Pitts. base	
1⅛-inch	3.25c
1⅛ to 1½-inch	2.75c
1⅝ to 1⅞-inch	2.60c
1⅛ to 2⅞-inch	2.45c
2⅛ to 6-inch	2.30c

Alloy Steel Bars □

Hot rolled

Pittsburgh, Buffalo, Chicago, Massillon	2.45c
Bethlehem	2.55c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 .15 to .25 Mo.	0.50
4600 .20 to .30 Mo. 1.25-1.75 Ni.	1.05
5100 .80-1.10 Cr.	0.45
5100 Cr. spring	base
6100 bars	1.20
6100 spring	0.70
Cr., Ni., Van.	1.50
Carbon van.	0.95
9250	carbon base plus extras

Strip and Hoops □

Hot strip to 23⅛-in. Pitts.	1.75c
Do., Chicago	1.85c
Do., del. Detroit	1.95c
Do., del. Phila.	2.04c
Do., del. N. Y.	2.08c
Cooperage hoop, Pittsburgh	1.85c
Do., Chicago	1.95c
Cold-rolled strip, Pitts., Cleve.	2.40c
Worcester	2.60c

Rails, Track Material □

(Gross Ton)

Stand. rails, mill	$36.37½
Relay rails, Pitts. 20-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$18.00
80-85 lbs.	$24.00
100 lbs.	$25.00
Light rails, billet qual., Pitts., Chi.	$32.00
Do., reroll. qual.	$31.00
Angle bars, mills	2.55c
Spikes, R. R., base	2.40c
Track bolts, base	3.40c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs. up $1; 12 lbs., up $2; 8 and 10 lbs. up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons or more; diff. for less.

Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full case lots, Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	70 off
Rolled thread, ½ x 6 and smaller	70 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts	70 off
Tire bolts	60 off
Stove bolts, 72½-25-10 off in pkgs.; 85 off in bulk, 5000 or more of a size.	
Rolled thread machine bolts, ½ x 6 and smaller	70 off
Step bolts	66 off
Elevator bolts	66 off

NUTS

Semifinished	70 off

HEXAGON CAP SCREWS

Milled	85 off
Upset 1-in., smaller	85-10 off

SQUARE HEAD SET SCREWS

Upset, 1-in., smaller	80 off
Upset, larger than 1-in.	80 off
Headless set screws	75-10 off

Rivets, Wrought Washers

Struc., c.l., Pitts. Cleve.	2.75c
Struc., c.l., Chi.	2.85c
7/16-in. & smaller, Pitts., Chi., Cleve.	70 and 10 off
Wrought washers, Pitts., Chi., Phila.	6.00-6.25 off

Cut Nails, Piling □

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more; no discount on size extras	$3.00
Do., less than 5 kegs; no discount on size extras	$3.15
Steel piling, Pitts.	2.00c
Steel piling, Chi., Buff.	2.10c

Pipe and Tubing

Base $200 net ton, except on standard comercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Gary, Ind., Lorain, O., to consumers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago delivered, 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

Steel

In.	Blk.	Gal.
¼ and ⅜	57	38½
½	62	50½
¾	65½	55½
1—3	67½	58½

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

Steel

2	63½	54½
2½—3	66½	57½
3½—6	68½	59½
7 and 8	67½	57½
9 and 10	67	57

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½
9—12	38	24½

LINE PIPE

Steel

⅛-inch, butt weld	50½
¼—⅜, butt weld	56
½, butt weld	61
¾, butt weld	64½
1—3, butt weld	66½
2-inch, lap weld	62½
2½—3, lap weld	65½
3½—6, lap weld	67½
7—8, lap weld	66½

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe list. 8—12 inch no extra.

BOILER TUBES

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3¾	50	3	17
4	52	3¾—3½	18
4½—6	42	4	20
1½	1	4½	21

On lots of a carload or more, above discounts subject to preferential of two 5% discounts on steel and 10% on charcoal iron.

Lapwelded steel: Under 10,000 lbs., 6 pts. under base and one 5%; on 10,000 lbs. to carload, 4 pts. under base and two 5%. Quantity discounts same as for hot-rolled. Charcoal iron: Under 10,000 lbs., 2 pts. under base; on 10,000 lbs. to carload, base and one 5%.

SEAMLESS BOILER TUBES

Cold Drawn

2—2¼	27	3¼—3½	44
2½—2¾	34	4	46
3	41	4½, 5, 6	46

(On 1—1¾-inch sizes mechanical tubing dis. apply.)

Hot Rolled

2—2¼	33	3¼—3½	50
2½—2¾	40	4	52
3	47	4½, 5, 6	42

Quantity discounts: Under 10,000 lbs., 10 pts. and 5%; 10,000 to 24,999 lbs., 6 pts. and 5%; 25,000 lbs. to carload, 2 pts. and 5 and 5%; carload and over, base discount and 5 and 5%. No extra for lengths 24 ft. and under.

Seamless Tubing □

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe □

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$35.00-36.00
4-in., Birm.	38.00-39.00
4-in., Chicago	46.00-47.00
6 to 24-in., Chicago	43.00-44.00
6-in. & over, east fdy.	40.00
Do., 4-in.	43.00

Class A pipe $3 over Class B. Stand. fitgs., Birm, base $90.00

Six to 24-inch, fittings, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Semifinished Steel □

Prices Per Gross Ton

BILLETS AND BLOOMS
4 x 4-inch base

Pitts., Chi., Cleve., open-hth. & bess.	$26.00
Philadelphia	31.30
Forging, Pitts., Chi.	31.00

SHEET BARS

Pitts., Cleve., Yong.	26.00
Chicago	26.00
Canton, O.	26.00

SLABS

Pitts., Cleve., Yong.	26.00

WIRE RODS

Pitts., Cleveland	$35.00
Chicago	36.00

SKELP

All grades, Pitts. and Chicago	1.60c

Coke □ □

Price Per Net Ton

BEEHIVE OVENS

Connellsville fur.	$3.75
Connellsville fdry.	4.25
Connell. prem. fdry.	5.25
New River fdry.	6.00
Wise county fdry.	4.25- 5.00
Wise county fur.	3.50- 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.71- 9.31
Chi. ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	10.50
St. Louis, del.	8.75
*Birmingham, ovens	5.00
Indianapolis, del.	8.75
Ashland, Ky., Connells., basis	5.50
Portsmouth, ovens, Connell. basis	5.50
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.00
Philadelphia, del	9.00

Coke By-Products □

Per gallon, producers' plants, Tank lots

	Spot
Pure benzol	$0.22
90 per cent benzol	0.22
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per lb., f.o.b. New York

Phenol (200 lb. drums)	0.163c
Do., (100 lb.)	0.173c

Per lb., producers' plants

Naphthalene flakes and balls	6.00- 7.25

Per 100 lb., Atlantic seaboard

Sulphate of ammonia	$1.20

Pig Iron

Delivered prices do not include switching charges except as noted. No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25

Gross Tons

	No. 2 Fdry.	Malleable	Basic	Bessemer
Basing Points:				
Bethlehem, Pa.	$17.50	$18.00	$17.00	$18.50
Birdsboro, Pa.	17.50	18.00	17.00	18.50
Swedeland, Pa.	17.50	18.00	17.00	18.50
Sparrows Point, Md.	17.50	18.00	17.00	18.50
From Swedeland, Pa., del. to Phila.	18.26	18.76	17.76	.....
From Bethlehem, del to Brooklyn..	19.77	20.27	.....	.....
From Bethlehem, del. to Newark, N. J.	18.99	19.39	.....	.....
Basing Point:				
Everett, Mass	18.00	18.50	17.50	19.00
From Everett, del. to Boston	18.50	19.00	18.00	19.50
Basing Point:				
Buffalo	17.50	18.00	16.50	18.50
From Buffalo, del. to Boston	18.50	19.00	18.00	19.50
Basing Points:				
Neville Island, Pa.	18.00	18.00	17.50	18.50
Sharpsville, Pa.	17.50	17.50	17.00	18.00
Youngstown, O.	17.50	17.50	17.00	18.00
From Neville Island, Pa., del. to Pittsburgh district	(Neville Island base, plus 63c to $1.13 switching charges)			
Basing Points:				
Erie, Pa.	17.50	18.00	17.00	18.50
Cleveland	17.50	17.50	17.00	18.00
Toledo, O.	17.50	17.50	17.00	18.00
Detroit	17.50	17.50	17.00	18.00
From Detroit, del. to Saginaw, Mich.	19.60	19.60	19.10	20.10
From Cleveland, del. to Akron, Canton, O.	18.76	18.76	18.26	19.26
From Toledo, del. to Mansfield, O...	19.26	19.26	18.76	19.76
Basing Point:				
Hamilton, O.	17.50	17.50	17.00	18.00
From Hamilton, del. to Cincinnati	18.51	18.51	18.01	19.01
Do., del. to Indianapolis	19.77	19.77	19.27	20.27
Basing Points:				
Duluth	18.00	18.00	.....	18.50
Chicago	17.50	17.50	17.00	18.00
Granite City, Ill.	17.50	18.00	17.00	.....
From Duluth, del. to St. Paul	19.94	19.94	.....	20.44
From Chicago, del. to Milwaukee..	18.50	18.50	18.00	19.00
From Chicago, Toledo or Detroit, del to Muskegon, Mich.	20.40	20.40	19.90	20.90
From Granite City, del. to St. Louis	(Granite City base, plus 50-cent switching charge)			
Basing Point:				
Birmingham, Ala.	13.50	.....	12.50	.....
From Birmingham del. to:				
Boston	18.12	.....	17.62	.....
Newark, N. J.	18.51	.....	.....	.....
Brooklyn, N. Y.	19.39	.....	.....	.....
Baltimore	18.02	.....	17.52	.....
Cleveland	19.64	.....	18.64	.....
Cincinnati	18.23	.....	17.11	.....
Chicago	18.16	.....	19.14	.....
St. Louis	17.62	.....	17.50	.....
Basing Point:				
Provo, Utah	16.50	.....	.....	.....

LOW PHOS.

Basing points: Birdsboro. Pa., Steelton, Pa., and Standish, N. Y.—$22.00. Basing point: Johnson City, Tenn.—.....

Philadelphia, standard and copper bearing..... 23.13

GRAY FORGE		CHARCOAL	
Valley furnace	17.25	Lake Superior fur.	20.50
Pitts. dist. fur.	17.75	Do., del. Chicago	23.54

SILVERY

Jackson County, O., base: 6%—$22.25; 7—$23.25; 8—$24.25; 9—$25.25; 10—$26.25; 11—$27.75.

BESSEMER FERROSILICON

Jackson County, O., base: 10%—27.25; 11—$28.75; 12—$30.25; 13—31.75; 14—$33.25; 15—$34.75; 16—$36.25.

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bess.	$4.30
Mesabi bessemer	4.65
Old range nonbess.	4.65
Mesabi nonbess.	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic, 56-63%, con.(nom.)	8.00- 9.00
Cop-free low phos. 58-65% (nom.)	10.00-10.50

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nom.)

Foreign manganiferous ore, 45-55% iron, 6-10% man.	8.50
No. Afr. low phos.	7.00
Swedish basic, 65%	8.00
Swedish low phos.	8.50
Spanish, No. Afr. basic, 50 to 60%.	7.00
Tungsten, spot, sh. ton unit, duty pd.	$14.00-14.25
N. F. fdy., 55%.	7.00
Chrome ore, 48% gross ton c.i.f.	$17.00-18.00

Manganese Ore

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasion, 52-55%	22.00
So. African, 52%.	21.00-22.00
So. Afr., 49-51%.	20.00-21.00
Indian, 48-50%	nominal

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pa., Ohio, Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	48.00

Second Quality

Pa., Ohio, Ill., Ky., Md., Mo., Ga., Ala.	40.00

MALLEABLE BUNG BRICK

All bases	50.00

SILICA BRICK

Pennsylvania	$45.00
Joliet E. Chicago	54.00
Birmingham, Ala.	55.00

MAGNESITE BRICK

Per Net Ton, 9 x 4½ x 2½

Burned	$65.00
Unburned	55.00

CHROME BRICK

Per Net Ton

F.o.b. ship. point.	$45.00

MAGNESITE

Dead burned grain, Chester, Pa., Baltimore bases, net	40.00
Domes, Chewelah, Wash., base	22.00

Fluorspar

85 and 5 per cent grade

Washed gravel, duty paid, tide, gross ton	$20.00
Washed gravel f.o.b. Ill., Ky., net ton, carloads	$15.00

Ferroalloys

(In dollars, except Ferrochrome)

Ferromanganese, 78-82% tidewater, duty pd.	82.00
del. Pitts.	87.24
Spiegeleisen, 19-20%, dom., fur., spot†	27.00
Ferrosilicon, 50%, frieght all., c. l.	74.50
Do, less carload	82.50
Do, 75 per cent.	120-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	85.00
2% carbon	90.00
1% carbon	100.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	9.50
Do, spot del.	10.00
Ferrotungsten, stand., lb. cont.	1.16- 1.25
Ferrovanadium, 35 to 40%, lb. cont., on analysis	2.60- 2.80
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton., frt., all., lb.	7.00
Do, under 1 ton	7.50
Ferrophosphorus, per ton, c. l. 17-19%, Rockdale, Tenn., basis; 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads. Quan. diff. apply.

Nonferrous Mill Products

F.o.b. mill base, cents per lb., except as specified. Copper, brass products based on 9.00c, Conn., copper

Sheets

Yellow brass (high)	14.75
Copper, hot rolled	17.12½
Lead, cut, to jobbers	8.00
Zinc, 100-lb. base	9.00

Tubes and Pipes

High yellow brass.	16.37½
Seamless copper	16.62½

Rods

High yellow brass.	12.25
Copper	13.87½

Anodes

Copper, untrimmed	14.50

Wire

Yellow brass (high)	14.75

Old Metals

Deal. buying prices, cents lb.

No. 1 Composition Red Brass

New York	4.37½-4.87½
Chicago	4.25- 4.50
Cleveland	4.25- 4.75
St. Louis	3.50- 3.75

Heavy Copper and Wire

*New York	6.25-6.37½
Chicago, No. 1	5.75- 6.00
Cleveland	5.00- 5.50
St. Louis	5.25

Composition Brass Borings

New York	4.12½-4.37½

Light Copper

New York	5.25- 5.50
Chicago	4.50-4.87½
Cleveland	4.50- 5.00
St. Louis	4.25

Light Brass

Chicago	2.75- 3.00
Cleveland	2.50- 3.00

Lead

New York	3.25- 3.37½
Cleveland	3.00- 3.25
Chicago	3.00- 3.25
St. Louis	2.50- 2.75

Zinc

New York	2.25- 2.50
Cleveland	2.25- 2.50
Chicago	2.00- 2.25
St. Louis	2.25- 2.50

Aluminum

Clips, soft, Cleve.	11.50-12.00
Borings, Cleve.	4.75- 5.00
Mixed, cast, Cleve.	7.25- 7.50
Mixed, cast, St. L.	7.00- 7.50

Secondary Metals

*Brass ingot, 85-5-5-5	8.50
Remelt Al., No. 12.	12.00-12.50

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL	□
Birmingham	8.50- 9.00
Boston, dealers	5.25- 5.50
Buffalo, No. 1	9.25-10.00
Buffalo, No. 2	8.00- 8.50
Chicago	8.00- 8.50
Cleveland, No. 1	9.00- 9.50
Cleveland, No. 2	8.50- 9.00
Detroit, No. 1	7.00- 7.50
Detroit, No. 2	6.25- 6.75
Eastern Pa.	9.50
Eastern Pa., No. 2	8.00
Federal, Ill.	7.25- 7.75
Granite City, Ill.	7.25- 7.75
N. Y., deal. R. R.	7.50
N. Y., deal. No. 2	6.50
Pittsburgh, No. 1	11.25-11.75
St. L., No. 1 del.	8.00- 8.50
Valleys, No. 1	11.50-12.00

COMPRESSED SHEETS	□
Buffalo, dealers	8.00- 8.50
Chicago, factory	7.00- 7.50
Cleveland	8.25- 8.75
Detroit	7.00- 7.50
E. Pa., new mat.	9.50-10.00
Pittsburgh	11.00-11.50
Valleys	11.00-11.50

BUNDLED SHEETS	□	□
Buffalo	5.50- 6.00	
Cincinnati, del.	5.50- 6.00	
Cleveland	6.25- 6.75	
Eastern Pa.	9.00- 9.50	
Pittsburgh	10.00-10.50	
St. Louis	5.00- 5.50	

SHEET CLIPPINGS LOOSE	□
Chicago	4.00- 4.50
Cincinnati	4.50- 5.00
Detroit	5.00- 5.50
St. Louis	4.50- 5.00

STEEL RAILS, SHORT	□
Birmingham	10.00-11.00
Boston, dealers	5.25- 5.50
Buffalo	12.00-12.50
Chicago (3 ft.)	10.00-10.50
Chicago (2 ft.)	10.50-11.00
Cincinnati, del.	11.00-11.50
Detroit	8.50- 9.00
Pitts., (open-hearth, 3 ft. and less)	13.50-14.00
St. Louis	10.50-11.00

STOVE PLATE	□	□
Birmingham	6.50- 7.00	
Boston, dealers	4.50- 4.75	
Buffalo	8.50- 9.00	
Chicago, net	6.00- 6.50	
Cincinnati, dealers	6.00- 6.50	
Detroit, net	4.50- 5.00	
Eastern Pa.	8.00	
N. Y., deal., fdry	5.00- 5.50	
St. Louis	6.50- 7.00	

COUPLERS, SPRINGS	□
Buffalo	11.50-12.00
Chicago	9.00- 9.50
Eastern Pa.	13.00-13.50
Pittsburgh	13.50-14.00
St. Louis	9.00- 9.50

ANGLE BARS—STEEL	□
Chicago	9.00- 9.50
St. Louis	8.75- 9.00

LOW PHOSPHORUS	□	□
Buffalo, billets and bloom crops	11.50-12.50	
Cleveland bil. and bloom crops	12.50-13.50	
Eastern Pa. crops	14.00-14.50	
Pittsburgh billet bloom crops	13.50-14.00	
Pitts., sheet bar crops	13.50-14.00	

FROGS, SWITCHES	□	□
Chicago	8.50- 9.00	
St. Louis	9.00- 9.50	

SHOVELING STEEL	□
Chicago	8.00- 8.50
St. Louis	8.00- 8.50

RAILROAD WROUGHT	□
Birmingham	7.00- 8.00
Boston, dealers	2.00- 2.50
Buffalo, No. 1	7.00- 8.00
Buffalo, No. 2	9.50-10.00
Chicago, No. 1, net	7.00- 7.50
Chicago, No. 2	8.00- 8.50
Cinci., No. 2	8.00- 8.50
Eastern Pa.	10.00
N. Y., No. 1 deal.	7.00- 7.50
Pittsburgh, No. 1	11.25-11.75
St. Louis, No. 1	6.00- 6.50
St. Louis, No. 2	8.00- 8.50

SPECIFICATION PIPE	□
Boston	4.00- 4.50
Eastern Pa.	9.50
N. Y., deal.	4.75- 5.25

BUSHELING	□	□
Buffalo, No. 1	8.00- 8.50	
Chicago, No. 1	7.00- 7.50	
Cinci., No. 1 deal	5.75- 6.25	
Cincinnati, No. 2	2.50- 3.00	
Cleve., No. 2	7.00- 7.25	
Det., No. 1 new	6.25- 6.75	
St. Louis, No. 1	4.50- 5.00	
Valleys, new No. 1	10.50-11.00	

MACHINE TURNINGS	□
Birmingham	3.50- 4.50
Boston, dealers	2.00
Buffalo	6.25- 6.50
Chicago	5.00- 5.50
Cinci., dealers	4.50- 5.00
Cleveland	7.00- 7.50
Detroit	5.50- 6.00
Eastern Pa.	6.50
New York, dealers	2.50- 3.00
Pittsburgh	7.50- 8.00
St. Louis	4.00- 4.50
Valleys	7.00- 7.50

BORINGS AND TURNINGS	□
For Blast Furnace Use	
Boston, dealers	2.00
Buffalo	6.25- 6.50
Cincinnati, dealers	4.50- 5.00
Cleveland	7.00- 7.50
Detroit	6.00- 6.50
Eastern Pa.	5.50- 6.00
New York, dealers	2.00- 2.50
Pittsburgh	7.50- 8.00

CAST IRON BORINGS	□
Birming., plain	3.50- 4.50
Boston, chemical	8.50- 9.00
Boston, dealers	3.25- 3.50
Buffalo	6.25- 6.50
Chicago	5.00- 5.50
Cincinnati, dealers	4.50- 5.00
Cleveland	7.00- 7.50
Detroit	6.00- 6.50
E. Pa., chemical	12.00-15.00
New York, dealers	3.00
Pittsburgh	7.50- 8.00
St. Louis	4.00- 4.50

PIPE AND FLUES	□	□
Cinci., dealers	4.00- 4.50	

RAILROAD GRATE BARS	□
Buffalo	5.00- 5.50
Chicago, net	6.00- 6.50
Cincinnati	4.75- 5.25
Eastern Pa.	8.00
New York, dealers	5.25- 5.50
St. Louis	5.50- 6.00

FORGE FLASHINGS	□	□
Boston, dealers	3.75- 4.00	
Buffalo	8.00- 8.50	
Cleve., over 10-in.	8.50- 9.00	
Detroit	5.50- 6.00	

FORGE SCRAP	□	□
Boston, dealers	4.00- 4.50	
Chicago, heavy	9.50-10.00	
Eastern Pa.	10.00-10.50	

ARCH BARS, TRANSOMS	□
Chicago, net	6.50- 7.00
St. Louis	9.00- 9.50

AXLE TURNINGS	□	□
Boston, dealers	3.50- 3.75	
Buffalo	7.50- 8.00	
Chicago, elec. fur.	7.00- 7.50	
Cleveland	9.00- 9.50	
Eastern Pa.	9.00- 9.50	
St. Louis	5.00- 5.25	

STEEL CAR AXLES	□
Birmingham	8.00- 9.00
Boston, ship. point	8.00- 8.50
Buffalo	10.00-11.00
Chicago, net	10.00-10.50
Eastern Pa.	15.00
St. Louis	11.00-11.50

SHAFTING	□	□
Boston, ship. point	9.25-9.50	
Eastern Pa.	15.00	
New York, dealers	9.50-10.00	
St. Louis	7.50- 8.00	

CAR WHEELS	□	□
Birmingham, iron	7.00- 8.00	
Boston, iron deal	6.00- 6.50	
Buffalo, iron	8.00- 9.00	
Buffalo, steel	10.50-11.00	
Chicago, iron	9.00- 9.50	
Chi., rolled steel	9.50-10.00	
Cincinnati, iron	8.00- 8.50	
E. Pa., iron	11.50-12.00	
E. Pa., steel	13.00-13.50	
Pittsburgh, iron	10.50-11.00	
Pittsburgh, steel	13.50-14.00	
St. Louis, iron	6.50- 7.00	
St. Louis, steel	9.50-10.00	

NO. 1 CAST SCRAP	□	□
Birmingham	8.50- 9.00	
Boston, No. 2	5.00- 5.50	
Boston, Tex. con.	10.25-10.50	
Buffalo, cupola	9.50-10.00	
Buffalo, mach.	10.00-10.50	
Chicago, agri. net	7.00- 7.50	
Chi., mach. net	7.75- 8.25	
Chi., railroad net	8.00- 8.50	
Cinci., mach. cup	8.00- 8.50	
Cleveland, cupola	8.50- 9.00	
Detroit, net	7.00 7.50	
E. Pa., cupola	12.00	
N. Y., cup. deal.	6.00- 6.50	
N. Y., del. local foundries	9.00- 9.50	
Pittsburgh, cupola	11.00-11.50	
San Fran., del.	13.50-14.00	
Seattle	4.50- 6.50	
St. Louis, No. 1	8.00- 8.50	
St. L., No. 1 mach.	8.50- 9.00	

HEAVY CAST	□	□
Boston, del.	5.00- 5.50	
Buffalo, break	7.00- 7.50	
Cleveland, break	6.75- 7.00	
Detroit, break	5.00- 5.50	
Detroit, auto net	7.50- 8.00	
Eastern Pa.	10.00-10.50	
N. Y., No. 1, deal	6.50- 7.00	
N. Y., break. deal	5.50- 6.00	
Pittsburgh	10.00-10.50	

MALLEABLE	□	□
Boston, consum	12.00-12.25	
Buffalo	10.00-11.00	
Chicago, R. R.	8.50- 9.00	
Cinci., agri. del.	8.00- 8.50	
Cinci., R. R. del.	8.50- 9.00	
Cleveland, rail	11.00-11.50	
Detroit, auto	6.50- 7.00	
St. Louis, R. R.	8.00- 8.50	
Eastern Pa., R. R.	12.50-13.00	

RAILS FOR ROLLING	□
5 *feet and over*	
Birmingham	9.00-10.00
Boston, dealers	7.00- 7.25
Buffalo	9.00- 9.50
Chicago	10.00-10.50
Eastern Pa.	12.50
New York, dealer	6.50- 7.00
St. Louis	9.25- 9.75

LOCOMOTIVE TIRES	□
Chicago (cut)	9.50-10.00
St. L., No. 1	8.00- 8.50

LOW PHOS. PUNCHINGS	□
Buffalo	11.00-11.50
Chicago	10.00-10.50
Eastern Pa.	12.50-13.50
Pittsburgh	13.50-14.00

Nonferrous Metal Prices of the Week

Spot unless otherwise specified. Cents per pound

	Copper: Electro., del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead: New York	Lead: East St. L.	Zinc: St. L.	Aluminum 98-99%	Antimony Spot, N. Y.	Ingot Nickel
Nov. 11	8.25	8.37½	8.00	52.87½	53.25	4.30	4.15	4.50	*22.90	7.00	35.00
Nov. 13	8.25	8.37½	8.00	53.75	54.12½	4.30	4.15	4.50	*22.90	7.20	35.00
Nov. 14	8.25	8.37½	8.00	55.00	55.42½	4.30	4.15	4.50	*22.90	7.25	35.00
Nov. 15	8.25	8.37½	8.00	55.65	56.05	4.30	4.15	4.50	*22.90	7.25	35.00
Nov. 16	8.25	8.37½	8.00	55.00	55.75	4.30	4.15	4.50	*22.90	7.25	35.00
Nov. 17	8.25	8.37½	8.00	53.75	54.30	4.30	4.15	4.50	*22.90	7.25	35.00

*Nominal quotation. Market range 19.90c to 22.90c.

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore*	2.60c
Boston††	2.90c
Buffalo	2.95c
Chattanooga..	3.05c
Chicago	2.90c
Cincinnati	3.10c
Cleveland	2.90c
Detroit	2.98½c
Houston	2.40c
Los Ang.	3.30c
New Orleans	3.00c
New York‡(d)	3.17c
Philadelphia*	2.60c
Pittsburgh	2.85c
Portland	3.40c
San Fran.	3.55c
Seattle	3.40c
St. Louis	3.14c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS □

Baltimore* ...	2.60c
Chattanooga..	3.05c
Chicago	2.75c
Cincinnati	3.10c
Detroit	2.98½c
New York‡(d)	3.10c
Philadelphia*	2.60c
St. Louis	3.14c
Tulsa	3.25c

REINFORC. BARS □

Baltimore	2.35c-3.00c
Boston	2.75c-3.25c
Buffalo	1.95c
Chattanooga..	3.05c
Chicago	1.95c-2.10c
Cincinnati	3.10c
Cleveland	2.22½c
Houston	3.00c
Los Ang. cl....	3.00c
New Orleans	3.00c
New York	3.17c
Phila.	2.62½c
Pittsburgh	3.00c
S. Fran. f.o.b.	3.15c
Seattle	3.50c
St. Louis	3.29c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES □

Baltimore* ...	2.60c
Boston††	3.07c
Buffalo	3.20c
Chattanooga..	3.30c
Chicago	3.10c
Cincinnati	3.30c
Cleveland	3.21c
Detroit	3.30c
Houston	2.65c
Los Ang.	3.30c
New Orleans	3.50c
New York(d)	3.27c
Philadelphia*	2.60c
Pittsburgh	3.05c
Portland	3.40c
San Fran.	3.55c
Seattle	3.40c
St. Louis	3.34c
St. Paul	3.25c
Tulsa	3.50c

PLATES □

Baltimore* ...	2.60c
Boston††	3.08c
Buffalo	3.20c
Chattanooga..	3.30c
Chicago	3.10c
Cincinnati	3.30c
Cleveland, ¼ in. and thicker	3.21c
Cleve., 3/16-in	3.20c
Detroit	3.30c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles ..	3.30c
New Orleans	3.50c
New York (d)	3.30c
Philadelphia*	2.60c
Phila. floor....	4.35c
Pittsburgh	3.05c
Portland	3.40c
San Fran.	3.50c
Seattle	3.40c
St. Louis	3.34c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE □

Baltimore* ...	2.75c
Boston††	2.90c
Buffalo	3.10c
Chattanooga..	3.50c
Chicago	2.95c
Cincinnati	3.10c
Cleveland	3.01c
Det., 8-10 ga.	3.03½c
Houston	3.35c
Los Ang.....	3.45c
New Orleans	3.50c
New York	3.17c
Portland	3.65c
Philadelphia*	2.75c
Pitts.	2.85c
San Fran.	3.75c
Seattle	3.65c
St. Louis 3.19c-	3.36c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK □

Balt.*†	3.50c
Boston††	3.75c
Buffalo	3.25c
Chattanooga..	4.00c
Chicago	3.70c
Cincinnati	3.85c
Cleveland	3.76c
Detroit	3.78½c
Los Ang.	4.05c
New York	3.65c
Philadelphia*†	3.40c
Pitts.	3.35c
Portland	4.25c
San Fran.	4.25c
Seattle	4.25c
St. Louis	3.94c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS □

Balt.*†	3.75c
Buffalo	4.00c
Boston	4.60c
Chattanooga..	4.25c
Chicago 4.20c-	4.30c
Cincinnati	4.45c
Cleveland	4.36c
Detroit	4.45c
Houston	3.57c
Los Ang.	4.65c
New Orleans	4.35c
New York	4.25c
Pitts.** 3.95c-	4.20c
Portland	4.85c
San Fran.	4.85c
Seattle	4.85c
St. Louis	4.54c
St. Paul	4.19c
Tulsa	5.10c
Philadelphia*†	4.00c

BANDS □

Baltimore	2.90c
Boston††	3.15c
Buffalo	3.30c
Chattanooga..	3.25c
Chicago	3.20c
Cincinnati	3.35c
Cleveland	3.26c
Det. 3/16-in. & lighter ..	3.28½c
Houston	2.85c
Los Ang.	3.80c
New Orleans	3.20c
New York(d)	3.42c
Philadelphia...	2.90c
Pittsburgh	3.10c
Portland	3.90c
San Fran.	3.15c
Seattle	3.90c
St. Paul	3.20c
Tulsa	3.45c
St. Louis	3.44c

HOOPS □

Baltimore	2.80c
Boston	4.15c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.35c
Det. No. 14 & lighter ..	3.28½c
New York	3.42c
Philadelphia...	3.15c
Pittsburgh	3.75c
Seattle	5.40c
St. Paul	3.75c

COLD FIN. STEEL □

Baltimore (c)	3.33c
Boston 3.83c-	4.33c
Buffalo	3.25c
Chattanooga*	3.90c
Chicago	3.35c
Cincinnati	3.55c
Cleveland	3.25c
Detroit	3.40c
Los Ang.	5.85c
New Orleans ..	4.25c
New York	3.79c
Philadelphia..	3.58c
Pittsburgh	3.20c
Portland (f)..	4.75c
San Fran. (d)	5.85c
Seattle (f).....	4.75c
St. Paul	3.20c
St. Louis	3.44c
Tulsa	4.65c

COLD ROLL. STRIP □

Boston 0.100 in., 500 lb lots	5.20c
Buffalo	5.25c
Chicago (b) ..	5.65c
Cincinnati	5.80c
Cleve. (b)	5.55c
Detroit	5.40c
Philadelphia..	4.55c
New York	4.55c
St. Louis	5.74c

(a) Rounds, hex. only

(b) Net base straightening, cutting boxing 1 ton or more.

(c) Plus mill, size and quantity extras.

(d) Minus quant. diff.

(e) New mill classif.

(f) Rounds only.

‡Domestic bars.

*Plus quan. extras.

**Under 25 bundles.

*†50 or more bundles.

†New extras apply.

††Base 40,000 lbs., extras on less.

Prices at Detroit, Cleveland, Chicago, Pittsburgh, Cincinnati, Chattanooga, New York Boston, St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less up 50 cents; 400 to 9999 pounds, base; 10,000 to 19,999 pounds, 15 cents under; 20,000 to 39,999 pounds, 25 cents under; 40,000 pounds and over, 35 cents under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Nov. 16

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	
PIG IRON	£ s d		£ s d	£ s d
Foundry, 2.50-3.00 Silicon.	$16.00	2 18 6	$7.91	1 12 6
Basic bessemer.....	14.77	2 14 0*	7.30	1 10 0
Hematite, Phos. .03-.05....	16.41	3 0 0	....	.....
SEMIFINISHED STEEL				
Billets.....	$30.09	5 10 0	$11.44	2 7 0
Wire rods, No. 5 gage.....	41.03	7 10 0	21.90	4 10 0
FINISHED STEEL				
Standard rails.....	$42.39	7 15 0	$26.77	5 10 0
Merchant bars.....	1.65c	6 15 0	.69c	3 2 6
Structural shapes.....	1.80c	7 7 6	.63c	2 17 6
Plates, †¼ in. or 5 mm....	1.95c	8 0 0	.89c	4 1 0
Sheets, black, 24 gage or 0.5 mm.....	2.26c	9 5 0	1.27c	5 15 0
Sheets, gal., 24 gage, corr...	2.75c	11 5 0	1.60c to 1.76c	7 5 0 to 8 0 0
Bands and strips.....	1.89c	7 15 0	.83c	3 15 0
Plain wire, base.....	2.26c	9 5 0	1.18c	5 7 6
Galvanized wire, base.....	2.68c	11 0 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base.....	2.93c	12 0 0	1.27c	5 15 0
Tin plate box 108 lbs.....	$ 4.65	0 17 0	....	.....

British ferromanganese $82 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

			French Francs		Belgian Francs		Reich Marks
	£ s d						
Fdy. pig iron, Si. 2.5.....	$17.09	3 2 6(a)	$14.21	215	$14.49	305	$25.45	63
Basic bessemer pig iron....	16.14	2 14 0(a)*	12.23	185	13.78	290	28.08	69.50
Furnace coke.....	4.10	0 15 0	7.93	120	5.23	110	7.78	19.25
Billets.....	28.72	5 5 0	26.77	405	20.90	440	38.99	96.50
Standard rails.....	2.01c	8 5 0	2.10c	700	2.31c	1,100(b)	2.42c	132
Merchant bars.....	1.70c	7 0 0	1.68c	560	1.12c	535	2.01c	110
Structural shapes.....	2.14c	8 15 0	1.65c	550	1.12c	535	1.97c	107.50
Plates, †¼-in. or 5 mm....	2.07c	8 10 0	2.04c	680	1.42c	675	2.32c	127
Sheets, black.....	2.50c	10 5 0§	2.55c	850‡	1.58c	750‡	2.64c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.....	3.11c	12 15 0	4.35c	1,450	3.15c	1,500	6.77c	370
Plain wire.....	2.07c	8 10 0	3.39c	1,130	2.73c	1,300	3.24c	177
Bands and strips.....	2.56c	10 10 0	1.95c	650	1.42c	675	2.32c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel a del. Middlesbrough. b Since January.

Bars

Bar Prices, Page 48

Contrary to expectations of a month or so ago, the market on hot-rolled merchant bars gave every indication last week of being unchanged for first quarter when prices for that period will be filed early this week. Although this would mean a spot market reaffirmation of 1.75c, Pittsburgh, for important contract buyers who held 1.60c contracts through fourth quarter, this means an advance of $3 a ton. Alloy bars continue at 2.55c, Pittsburgh, with cold-drawn at the usual differential of 50 cents. A change in soft steel bar extras is being considered.

Consumer stocks of commercial steel and alloy bars are generally low in New England. Specifications continue light with a few scattered cars coming into this territory as needed. There has been some spot buying at 1.85c, Buffalo. Bolt and nut makers are not active.

Current requirements at Cleveland are limited to small lots, with little tonnage being released by railroads or automotive interests.

Sales and specifications of steel bars at Chicago are the best in six weeks, with some specifications from the automotive field. Miscellaneous consumers make little change in their shipments of bars. Rail steel bars are in fairly steady demand. Prices have not been indicated for first quarter.

Plates

Plate Prices, Page 48

Barge work appears the most active factor requiring steel plates at present. Close bidding featured a small barge job for Chicago engineers recently, Midland Barge Co., Midland, Pa., being low at $5536, followed closely by Nashville Bridge Co., Nashville, Tenn., at $5540. The contract was for two 40 x 14 x 3.6-foot open-deck steel barges for Joliet, Ill., delivery, taking 36 tons of plates.

Fabrication is now about half completed at Midland, Pa., on 1150 tons, mainly ¾ and ½-inch plates, which a Pittsburgh mill rolled a few weeks ago for Midland Barge Co. to assemble into 48 government pontoons. Delivery promised on this order is involving rush fabrication.

Marietta Mfg. Co., Point Pleasant, W. Va., advises it will need about 325 tons of plates and 175 tons of shapes for three 165-foot Coast Guard vessels recently placed by the government. Inquiry for 4500 tons of car plates, car shapes and heavy sheets for the Pennsylvania railroad is out. Delivery is for Altoona, Pa. Barge builders still consider active about 150 to 160 barges, probably 60 of which originate in the Chicago district. Most of these latter are cargo barges for the new Illinois waterway trade.

Plate buying in New England is for small miscellaneous requirements. More large tank and standpipe work is being figured.

Navy work calls for 16,100 tons of plates for two cruisers to be built at the Philadelphia and Brooklyn navy yards and two gunboats to be built at the Charleston, S. C., navy yard.

Shipwork is most in evidence in the East. The navy will open bids Nov. 17 for 2100 tons of special plates for one cruiser and Nov. 24 on 10,000 tons medium plates for this and one other cruiser and two gunboats as well as on approximately 4000 tons of special plates for the second cruiser and the gunboats. About 1500 tons of steel, principally plates, for a gasholder at Washington, has been placed with a Pittsburgh mill.

First section of the proposed Atlantic seadrome will require about 4000 tons of plates. Bids will be opened Nov. 23 on requirements of the Pennsylvania for 500 steel automobile cars to be built in its own shops.

Some sellers at Cleveland note a better flow of small orders, and more inquiries from miscellaneous users. Two to four barges for the Standard Oil Co., each requiring 600 tons of plates still are pending. Plate mill operations at Cleveland are intermittent, with a slight increase in the rate scheduled for this week.

Contracts Pending

17,000 tons, 60-inch welded steel for reinforced concrete pipe line. Hetch Hetchy project, San Francisco; city has voted bonds and bids will be called soon.

16,100 tons, bureau of construction and repairs, navy department, Washington, for two cruisers, one to be built at Philadelphia and one at Brooklyn, N. Y., and two gunboats to be built at Charleston, S. C.; bids Nov. 17 on 2100 tons special plates; Nov. 24 on 10,000 tons medium plates and 4000 tons special plates.

4500 tons, mostly car plates but including car shapes and heavy sheets, for 500 automobile freight cars for the Pennsylvania; bids Nov. 23 at Philadelphia; material for delivery through 1934 for Altoona, Pa.

4000 tons, first unit Atlantic seadrome; it is reported fabrication will be done by Belmont Iron Works, Philadelphia, and assembly by Sun Shipbuilding & Dry Dock Co., Chester, Pa.

2500 tons, tunnel liners for metropolitan water district, Los Angeles; bids Nov. 14.

825 tons, Brooklyn ad Philadelphia, bureau of supplies and accounts, navy department; bids Nov. 24, schedule 1160.

700 tons, sewage tunnel, Washington; bids to District of Columbia commissioners, Washington, probably Dec. 4.

425 tons, fuel oil tanks, navy, Melville, R. I.; bids Nov. 22.

180 tons, armor plate, bureau of ordnance, navy department; bids Dec. 5.

Unstated tonnage, 150,000-gallon tank and tower, state prison colony, Norfolk, Mass.

Unstated tonnage, standpipe, Townsend, Mass.; Pittsburgh-Des Moines Steel Co., Pittsburgh, low.

Sheets

Sheet Prices, Page 48

Sheet mill operations in the Pittsburgh district have expanded gradually, due mainly to the resumption of activity at several mills which were down ten days ago. Most sheet orders there are small and for quick delivery. Base prices are holding, and probably will be unchanged for the first quarter.

Recent releases for the Fisher Body Co. are the main support of mill operations in the Cleveland district, at about 50 per cent. With the completion of these specifications, however, the rate is expected to be down this week. The outlook is more encouraging as automobile builders swing into production of new models. Consumption by the stove, refrigerator and washing machine industries is slower.

Demand at Buffalo has improved slightly and production holds at 40 per cent.

Small tank fabricators in the New England territory are less active, slowing up demand from that direction.

Demand for galvanized sheets is relatively better than that for other grades in a quiet market at St. Louis. Inquiry is reported better at Birmingham.

At New York prices generally are expected to be extended, although the possibility of an increase in black is intimated in some quarters.

At Chicago, the market lacks improvement, with orders from the automotive industry yet to appear. Some radio companies have increased their output. Sheet production there averages around 25 per cent.

Consumption in the Philadelphia district is retarded by labor difficulties. The Baltimore producer is resuming production after several months of idleness.

A lagging demand for sheets for new automobile models is noted in

the Cincinnati district, with mill schedules close to 30 per cent.

Railroads

Track Material Prices, Page 49

Railroads will place their own contracts for rails and track fastenings and the government will not take bids or allocate the tonnages. The price has been set by agreement and further action is to be between the railroads and the steel producers. No action has been taken on prices of track fastenings and current quotations are in effect.

Direct placing of rails is viewed with satisfaction by railroads and railmakers as it tends to continue existing relations which promised to be disrupted if the government undertook to allocate tonnage.

Chicago, Rock Island & Pacific is to ask the federal court to allow the receiver to buy 35,000 tons of rails; Chicago & Northwestern is placing its order for 65,000 tons; Missouri-Kansas-Texas is ordering 4700 tons of 112-pound rails for 1934 delivery, to be laid in March in a new line of 25 miles from Eufala to McAlester, Okla., to be financed from the road's own funds; Louisville & Nashville is ordering 17,500 tons; Atlantic Coast Line has placed 5000 tons with Carnegie Steel Co., Pittsburgh.

Carnegie Steel Co., Pittsburgh, was engaged last week at its Edgar Thomson mill on the November portion of 7500 tons of 131-pound rails for the Norfolk & Western. This order will be completed in December.

Recent reports indicate the Pennsylvania will build all of its 7000 freight cars in its own shops instead of only 3000 to 4000 as recently indicated.

Rail Orders Placed

Atlantic Coast Line, 5000 tons, to Carnegie Steel Co., Pittsburgh.
Louisville & Nashville, 17,500 tons, to unnamed producers.

Rail Orders Pending

Chicago & North Western, 65,000 tons; being allocated.
Chicago, Rock Island & Pacific, 35,000 tons; permission of court asked for purchase.
Missouri-Kansas-Texas, 4700 tons, 112-pound; for 1934 delivery.

During September the United States did not import any telegraph or telephone wire, steel sheet piling or cast iron pipe or fittings.

Strip

Strip Prices, Page 49

Consumers of steel strip are not buying heavily. Pittsburgh mills are having difficulty scheduling much more than a few days' operations per week. No important demand, unless it comes from a dormant automobile industry, is expected to enliven the strip steel market over the balance of the year. According to expectations through last week, there would be no change in the Pittsburgh bases on hot and cold-rolled strip steel for first quarter and this will tend to delay specifications. Base prices are 1.75c on hot-rolled and 2.40c on cold-rolled strip.

Recent specifications for new model Chevrolets have been shipped by Cleveland mills and the market again is quiet, with little buying by automotive interests. Makers of cold-rolled strip are quoting "commodity prices," as provided under the code, for crown fender steel, and for automobile lamps. The base for the former is 3.10c, Cleveland or Pittsburgh; and for the latter, 3.20, No. 20 gage in both instances. Standard grades of No. 20 cold-rolled strip are 3.55c.

Some new England mills are being prodded for deliveries of cold-rolled strip, largely business placed following the cleanup of low-priced contract material. New cold strip buying is light at 2.60c, Pittsburgh. Cold-rollers are taking in little hot strip, having stocked heavily, as did tack makers.

In eastern Pennsylvania demand is listless and prices are unchanged.

Bolts and Nuts

Bolt, Nut, Rivet Prices, Page 49

Except for some government inquiries the bolt, nut and rivet market is quiet. Slackened structural activity has caused smaller demand for rivets. Needs of automotive builders have not yet become evident to makers at Pittsburgh, though some good orders from this source have been received at Cleveland, the most encouraging note in that market. Shipments at prices below 70 off on bolts and nuts, 70 and 10 off on small rivets, 2.75c, Pittsburgh, and 2.85c, Chicago, on large rivets have been ended by the Nov. 15 deadline.

At Chicago railroad needs are relied on to increase current demand as some added inquiry is coming from this source. Agricultural implement manufacturers are taking slightly more, though improvement is small.

Jobber and railroad demand at Cleveland has improved slightly and November volume bids fair to exceed that of October.

No award has been made by the Port of New York Authority on about 2000 tons of bolts, nuts and washers, on which Oliver Iron & Steel Corp., Pittsburgh, is low.

Wire

Wire Prices, Page 49

Seasonal reductions in demand for wire and wire products is noted, and little improvement is expected for some time. Cleveland producers find orders and specifications off.

In New England demand for manufacturers' wire holds better than for merchant wire and some specialties continue in good demand. Consumers bought ahead fairly heavily and are not in need of further supplies.

The opinion is held in some districts that wire nails may be advanced for first quarter.

Cold Finished

Cold Finished Prices, Page 49

Until last week there was divergent opinion concerning the steps producers would take on first quarter prices on cold-finished steel bars. The first quarter price is expected to be filed Nov. 20. Some have looked for an advance through all of the present quarter, in keeping with the advanced 1.75c base on hot-rolled bars, but others contend that cold bar drawers will go into 1934 at an unchanged 1.95c, Pittsburgh, base on cold drawn. In the meantime other bases at 2.00c, Cleveland, Buffalo and Chicago are quoted unchanged, as are base prices of 2.15c, Detroit, and 2.20c, Eastern Michigan.

There has been a mild flurry in cold-finished steel in New England, due in part to underestimating requirements. A buyer of shafting recently took four spot cars. Machinery builders are taking slightly more material.

Joint annual conventions of the Colorado Mining association, Colorado Metal Fund, and the Colorado section of the American Mining Congress will be held in Pueblo, Colo., Jan. 18.

Shapes

Structural Shape Prices, Page 48

Structural shape awards are heavier, demand coming chiefly from public works projects.

Taylor-Fichter Steel Construction Co., New York, is low on the New York Triboro bridge towers contract, taking 12,000 tons, and 8000 tons for the west side elevated highway have been tentatively awarded. Early closing on 13,000 tons for the Manhattan midtown postoffice also is expected. Plain material is being specified slightly heavier at 1.80c, eastern mill.

Specifications are expected out shortly for 6000 tons of steel, including 2000 tons of shapes and 4000 tons of plates, for an experimental section of a seadrome for which the government has allotted $1,500,000. Philadelphia reports it is due for fabrication by the Belmont Iron Works with assembly by the Sun Shipbuilding & Dry Dock Co. The section will comprise about one-fourth the total unit.

Should it prove successful the remaining three sections will be added, and eventually four additional complete units, forming an airway across the Atlantic. For the complete project 125,000 tons of steel would be required Fabricated material quotations at Philadelphia are firmer.

Pittsburgh also reports fabricated prices steadier. On an opening for the state of Pennsylvania recently, ½-cent a pound was the range between bidders, and fabricated erected structural steel is now going at prices closer to 5 cents a pound. Plain material is expected to continue 1.70c, Pittsburgh, for first quarter.

Inquiry in the New England district is heavier, bridge requirements being supplemented by more public works, bids on which are being asked.

A Pittsburgh mill will supply 3000 tons of piling, of which more than half is used piling, for dam No. 3 on the Allegheny river, through the contractors, Seeds & Durham, Philadelphia.

A fairly steady flow of small orders is noted at Cleveland, but tonnage is lacking.

At Buffalo inquiry is improving. The Syracuse, N. Y., grade elimination project will take 12,000 tons.

At Chicago, awards continue fairly heavy for Mississippi river lock and dam work. The latter construction accounts for 8000 tons of recent orders .

Shape Awards Compared

	Tons
Week ended Nov. 18.	28,092
Week ended Nov. 11	7,055
Week ended Nov. 4	13,859
This week in 1932	20,393
Weekly average, 1932	14,285
Weekly average, 1933	14,385
Weekly average, Oct.	14,719
Total to date, 1932	768,971
Total to date, 1933	676,126

Contracts Placed

9000 tons, approach spans, Golden Gate bridge, San Francisco, to Columbia Steel Co., San Francisco. Judson-Pacific Co., San Francisco, will fabricate 4500 tons. Seventy-five thousand tons for main span awarded in October, 1932, to McClintic-Marshall Corp., Bethlehem, Pa.

6800 tons, shapes and piling for lock

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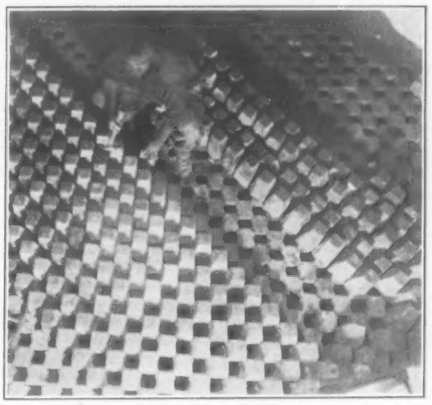
is the most outstanding development in Blast Furnace Stove Construction in the last decade. Its many advantages caused a major Steel Corporation to install them in the first stove to be completely rebuilt since 1929.



View of Inlet Checker: Single course is laid at top of checker chamber as shown above.

This Checker Brick has the required structural strength; the maximum weight where required; a greater heating surface per cubic foot of volume than any other Checker of the same flue area, without sacrificing weight; it gives complete cross-circulation, eliminates channeling and clogging for more than one brick length and can be built at the lowest cost per square foot of heating surface.

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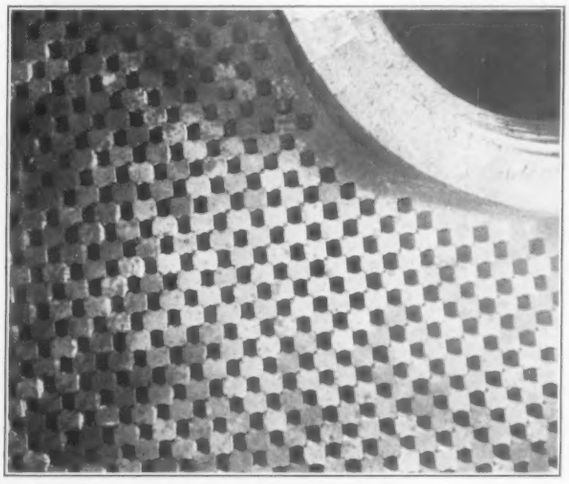

View at left shows 72nd Row of Top Checkers. Note the brick area — No thin surfaces. This design gives larger heating surface due to cut-back for cross-circulation.

No horizontal surfaces.

No clogged flues.

Maximum heating surface per cubic foot of volume.
Minimum cost per square foot of heating surface.

William M. Bailey Company

Pittsburgh—Pennsylvania

and dam No. 20, Canton, Mo.; 5000 tons of shapes to American Bridge Co., Pittsburgh; 1800 tons of piling reported to a United States Steel Corp. subsidiary.

3000 tons, buildings, Kingsport, Tenn., for Tennessee-Eastman Corp., to Virginia Bridge & Iron Co., Roanoke, Va.

1500 tons, lock, Tranpaleau, Wis., to American Bridge Co., Pittsburgh.

1470 tons, highway bridges, various locations Missouri; 730 tons to Kansas City Structural Steel Co., Kansas City, Mo.; 470 tons to St. Louis Structural Steel Co., St. Louis; and 270 tons to St. Joseph Structural Steel Co., St. Joseph, Mo.

1150 tons, hurricane gates, Lake Okeechobee, Fla., to Virginia Bridge & Iron Co., Roanoke, Va.

1000 tons, stock house, Kings brewery, Brooklyn, N. Y., to Berkshire Iron Works, Brooklyn, N. Y.

725 tons, two highway bridges, Woodward and Emerson counties, Oklahoma, to Capitol Iron & Steel Co., Oklahoma City, Okla.

458 tons, Soto street bridge, Los Angeles, to McClintic-Marshall Co., Bethlehem, Pa.

450 tons, state bridge, Woolwich, Me., to Lackawanna Steel Construction Corp., Buffalo.

400 tons, addition to plant, American Enko Co., Asheville, N. C., to Carolina Steel & Iron Co., Greensboro, N. C.

381 tons, bridge, Double Mountain Fork, Brazos river, Stonewall county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.; Buckner Bros., Cleburne, Tex., general contractor.

380 tons, bridge, Randolph county, Arkansas, to Pittsburgh-Des Moines Steel Co., Des Moines, Iowa.

377 tons, physical education building, Clemson agricultural college, Clemson College, S. C., to Ingalls Iron Works Co., Birmingham Ala.; through C. M. Guest & Son.

325 tons, highway bridge, Davenport Center, N. Y., to American Bridge Co., Pittsburgh.

325 tons, highway bridge, Taylor, Pa., to McClintic-Marshall Corp., Bethlehem, Pa.

309 tons, mill building, Stanley Works, New Britain, Conn., to Berlin Construction Co., Berlin, Conn.

235 tons, including some concrete bars, highway, Pope county, Arkansas, to Arkansas Foundry Co., Little Rock, Ark.

185 tons, buildings, Harvey lock, La., to Jones & Laughlin Steel Corp., Pittsburgh.

182 tons, Tongue river bridge, Montana, to unnamed interest.

170 tons, highway bridge, Carrollton, Ga., to Austin Bros. Bridge Co., Atlanta, Ga.

153 tons, including cutting edges, bridge, Gonzales county, Texas, to Virginia Bridge & Iron Co., Birmingham, Ala., and Wyatt Metal Works, Dallas, Tex.; Oran Speer, Alvord, Tex., general contractor.

150 tons, state bridge, Bath-Avoca, Steuben county, New York, to Lackawanna Steel Construction Corp., Buffalo; Cold Springs Construction Co., Akron, N. Y., general contractor.

150 tons, manufacturing building, E. J. Lavino & Co., Plymouth Meeting, Pa., to Norristown Iron & Wire Works, Bridgeport, Pa.

116 tons, federal bridge, Challis National Forest, Custer county, Idaho, to McClintic-Marshall Corp., Bethlehem, Pa.; Morrison-Knudsen Co., Boise, Idaho, general contractor. Steel Engineers Inc., Salt Lake City, Utah, awarded 40 tons of reinforcing bars.

115 tons, 160-foot swing span bridge, Orleans-St. Bernard parishes, Louisiana, to Vincennes Bridge Co., Vincennes, Ind.

110 tons, building, lighthouse depot, Mobile, Ala., to Jones & Laughlin Steel Corp., Pittsburgh.

110 tons, bridge superstructure, Schapperts Ford, Berkeley county, West Virginia, to Wheeling Structural Steel Co.; E. R. Mills, Charleston, W. Va., general contractor.

100 tons, state bridge in Granite county, Montana, to unnamed interest.

Contracts Pending

12,000 tons, towers, Triboro bridge, New York, Taylor-Fichter Steel Construction Co., New York, low.

8000 tons, west side elevated highway, Manhattan, New York; Harris Structural Steel Co., New York, low on steel bid to contractor; award dependent on signing of final contracts; Poirier McLane Corp. low on general contract.

2800 tons, piling, for Ulster county, New York, bids Nov. 28.

2800 tons, Nebraska highway bridges.

2500 tons, for United States Potash Co., Carlsbad, N. Mex.

1991 tons, four-span truss bridge, Parkers Landing, Pa.; bids at Harrisburg, Pa., Nov. 24.

1700 tons, bracing, Golden Gate bridge, San Francisco.

1545 tons, fertilizer plant in Louisiana, with site yet to be selected; Stone & Webster, New York, engineers.

1500 tons, causeway, Mare island, Calif.; bids Dec. 12.

1250 tons, highway bridges, Texas.

1000 tons, lock, Dresbach, Minn.; Duffin Iron Co., Chicago, low.

1000 tons, high school, Wilmington, Del.; Karno-Smith Construction Co., Trenton, N. J., low.

1000 tons, Barksdale Field, Shreveport, La.

900 tons, bridge, Norfolk, Va.

800 tons, sheet steel piling, seawall near Palm Beach, Ventura county, Califnia, for state; bids soon.

600 tons, three hangars for United States government, Quantico, Va.

500 tons, technical high school, Springfield, Mass.

445 tons, state bridge, Crawford county, Pennsylvania; bids Dec. 1.

300 tons, two state bridges, Woolwich, Me.

250 tons, pier and quay walls, Pearl Harbor, T. H.; bids Nov. 15.

200 tons, garage and hangar, United States quartermaster, Fairfield, O.

Concrete Awards Compared

	Tons
Week ended Nov. 18	**2,995**
Week ended Nov. 11	**2,100**
Week ended Nov. 4	**3,533**
This week in 1932	**2,669**
Weekly average, 1932	**3,920**
Weekly average, 1933	**3,516**
Weekly average, Oct	**4,852**
Total to date, 1932	**194,566**
Total to date, 1933	**165,272**

190 tons, lumber storage shed, Philadelphia navy yard; McCormack, Lenhan Co., Philadelphia, low for general contract.

200 tons, naval ammunition depot, Ft. Mifflin, Pa.

190 tons, New Hampshire avenue viaduct, Washington.

110 tons, state bridge, Pecos river, Fort Stockton-Monahans, Tex; bids in Nov. 20.

Reinforcing

Reinforcing Bar Prices, Page 49

Mill prices on reinforcing steel are steady, and mill lengths are 1.80c base, Pittsburgh, for new billet steel. Producers of rail steel for reinforcing purposes have made no change in their market at 1.75c base, Pittsburgh.

Government work is coming out more freely and aside from river dam and lock work around Pittsburgh, which is active, the state of Pennsylvania continues to issue weekly specifications for highway jobs.

Inquiries in New England total several thousand tons, the largest volume in months being active. State hospital buildings at Norfolk, Boston and Westboro, Mass., take substantial tonnage.

At Philadelphia demand for reinforcing bars is quiet. A fairly large tonnage is pending at Cleveland for public work.

New York and New Jersey state highways and bridges continue to support the reinforcing steel market with additional inquiry for both mesh and bars.

Contracts Placed

721 tons, buildings at Hamilton Field, Calif., to Soule Steel Co., San Francisco.

350 tons, paving, Langley Field, Virginia, to American Steel & Wire Co., New York.

289 tons, new billet steel bars for delivery to Panama for the war department, to Bethlehem Steel Corp., Bethlehem, Pa.

242 tons, state bridge, Gonzales county, Texas, to Alamo Iron Works, San Antonio, Tex.; Oran Speer, Alvord, Tex., general contractor.

225 tons, Queens and Nassau counties, New York, to Igoe Bros., Newark, N. J.; through Norwin Construction Co.

195 tons, bridge, Cabell county, Virginia, to Wheeling Steel Co., Wheeling W. Va.; Price Construction Co., Huntington, W. Va., contractor.

169 tons, bridge, Double Mountain Fork, Brazos river, Stonewall county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.; Buckner Bros., Cleburne, Tex., general contractors.

135 tons, buildings at Hamilton Field, Calif., to Pacific Coast Steel Corp., San Francisco.

127 tons, state bridge, Montague county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.; Oran Speer, Alvord, Tex., general contractor.

122 tons, highway structure, Queens, New York, to Concrete Steel Co., New

York; through Atwell-Guston-Morris Inc.

115 tons, mesh, highway, Oxford-Southbury, Conn., to American Steel & Wire Co., New York; D. V. Frione & Co. Inc., New Haven, general contractor.

105 tons, Boulder Dam, Boulder City, Nev., specification A 3316-B, to unnamed interest.

100 tons, or more, barracks No. 4, Fort Benning, Ga., to Dudley Bar Co., Bessemer, Ala.; Grahn Construction Co., Atlanta, Ga., general contractor.

100 tons, highway, Orange county, New York, to Pittsburgh Steel Co., Pittsburgh; through W. G. Satzman.

Contracts Pending

6500 tons, pier, quay walls and repair basin, Pearl Harbor, T. H.; bids Nov. 15.

2000 tons, municipal auditorium, Kansas City, Mo.;Boaz-Kiel Construction Co., St. Louis, and Boyle-Prior Construction Co., Kansas City, low bidders.

900 tons, dry dock, Philadelphia navy yard; William Eisenberg & Sons, Camden, N. J., low.

450 tons, highway, Paramus to Wearimus road, Bergen county, New Jersey; George M. Brewster & Sons Inc., Bogota, N. J., low.

400 tons, hosiery workers' housing development, Philadelphia; William Steele, Philadelphia, low.

300 tons, causeway, Mare Island, Calif.; bids Dec. 12.

275 tons, federal road on Kauai Island, T. H.; bids soon.

275 tons, highways, various counties, Texas; bids in Nov. 20.

200 tons, dormitories, prison colony, Norfolk, Mass.; bids Nov. 23.

200 tons, highway, route 29, section 11A, southern branch of Raritan river to Centerville, Hunterdon county, New Jersey; bids Dec. 4. Also one 30-foot, and one 14-foot span stream bridges.

Pipe

Pipe Prices, Page 49

Outlook for pipe buying is somewhat improved, with the sanctioning of further federal loans for municipal water systems and the appearance of two sizable inquiries in the Pittsburgh district, one from an oil company for about 2500 tons of line pipe, the other from the Russian government for about 20,000 tons of similar pipe. Boiler tube demand, however, is poor and standard pipe finds few buyers.

Recent advance in cast pipe prices in the East is tested on substantial tonnages for Bayonne, N. J., and Latham, N. Y.

Boston reports heavier bookings by the New England foundry, with a consequent stepping up of operations.

Bids are in on an unstated tonnage of cast iron pipe for the Cincinnati waterworks project, but awards have been deferred pending approval of the public works administration. Total figure is about $350,000.

Pipe mills in the Birmingham, Ala., territory are operating at not over 30 per cent of capacity. Pressure pipe prices there are firmer but unchanged.

Cast Pipe Placed

1609 tons, 20 and 24-inch class 100, Long Beach, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

250 tons, 2 to 8-inch, class 150, Hamilton Field, Calif., to National Cast Iron Pipe Co., Birmingham, Ala.

110 tons, 4 to 8-inch, class 150, Beverly Hills, Calif., to American Cast Iron Pipe Co., Birmingham, Ala.

100 tons, 16-inch monocast, for Twenty-sixth street improvement, Tacoma, Wash., to American Cast Iron Pipe Co., Birmingham, Ala.

Cast Pipe Pending

30,000 tons, San Francisco; city has voted bonds and bids will be called for shortly.

1000 tons, 24-inch, Wilmette, Ill.; bids Dec. 6.

935 tons, 12-inch, Madison, Wis.

550 tons, 6, 8 and 12-inch, Croton-on-Hudson, N. Y.; bids Nov. 21.

129 tons, 8-inch, class 150, Redwood City, Calif.; bids soon.

Unstated tonnage, water mains, East Bloomfield, N. Y.; expenditure of $35,000 has been authorized.

Steel Pipe Pending

20,000 tons, various small and large sizes, oil pipeline for export to Russia; project to be purchased by Russian government.

2500 tons, 50 miles of 6⅝ and 8⅝-inch line pipe for White Eagle Oil & Refining Co., Wichita, Kans., subsidiary of Socony-Vacuum Corp.

Tin Plate

Tin Plate Prices, Page 48

Near-capacity operations continue in tin mills in the Pittsburgh district, but mill backlogs are narrowing, and most producers foresee a decided slackening in December. Some mills are soliciting November business. Within the next week or ten days the price of tin plate for 1934 will be announced, with certain other decisions affecting discounts and trade relations.

Chile was the largest buyer of steel rails for the United States in September, taking 4988 gross tons of the 6165 tons exported.

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Pig Iron

Pig Iron Prices, Page 50

Under the iron and steel code, all contracts not specified and shipped by the close of the year are canceled, a provision which is sustaining shipments in most centers. Spot buying is lighter and books have not been opened for first quarter.

Present quotations are firm. Despite increased costs, a number of producers believe the present market would not support an increase.

Important consumers in the Cleveland district, including automotive interests, are reported to have heavy stocks; yet November shipments are exceeding those of October.

Several Pittsburgh district steel foundries appear to be increasing their melt, but are buying scrap at $14 a ton instead of pig iron. Two foundries there recently divided an order for 90,000 pounds of steel castings.

Consumers at Cincinnati are disposed to take all iron an contract, thus maintaining shipments at a good rate.

Elimination of uncertainty over first-quarter prices is counted upon to release a fair volume of business at Boston after books for the quarter are opened. A similar situation is noted at Philadelphia.

Republic Steel Corp. and Bethlehem Steel Co. have suspended one blast furnace each at Buffalo, while Hanna Furnace Corp. has added a second stack for an indefinite run.

Sales at Toronto, Ont., showed a minor gain for the week.

New buying at St. Louis has declined further, but stove plants there continue active. Stove foundries in the Birmingham, Ala., district also are taking some iron, although the market is dull.

Regardless of price movement, producers at New York look for an increase in specifications over the remainder of the year, since recent releases have been slow and contracts for the quarter ironclad. A possible advance of $1 per ton to become effective immediately is considered as likely in some quarters, on the theory that with minimum prices already filed, any increase at this time would not be subject to the 10-day filing clause of the steel code.

Refractories

Refractories Prices, Page 50

Pittsburgh—Demand for refractory brick from open hearth and blast furnace operators has almost completely vanished. By contract with three months ago, when these users of brick were pressing refractory producers for delivery, the same buyers now have been shutting off shipments. In fact, several blast furnace relining jobs here have been halted, only partially completed. One West Virginia mill's blast furnace job, for example, stands today half completed. Schedule of base prices on brick continue unchanged.

Coke

Coke Prices, Page 49

With unchanged prices prevailing through this month, foundries, blast furnaces and other melters of beehive coke have had little incentive to accumulate stock. The market is quoted at $3.75, Connellsville, ovens, for standard furnace coke with beehive foundry coke $4.25 and premium foundry coke $5.25, beehive ovens.

By-product coke holds steady, with shipments at unchanged rate, domestic shipments being increased by cold weather. Some stocks are being developed in advance of possible weather difficulties.

Iron Ore

Iron Ore Prices, Page 50

Cleveland—Lake Superior iron ore shipments for the season probably will be completed by Nov. 24, only three operators now having vessels in service, loading their final cargoes. The movement this month, therefore, can be estimated at 750,000 tons, bringing the total for the season to 21,592,000, compared with 3,500,000 tons last year. The trade believes the movement next year will show substantial improvement, some expectations running as high as 30,000,000 tons.

The Lake Superior Iron Ore association reports the following:

	Tons
Consumed in September.....	2,102,076
Consumed in October.....	1,897,589
Decrease in October.....	204,487
Consumed in October, 1932	735,010
Ore at furnaces Nov. 1, 1933	31,043,968
On Lake Erie docks Nov. 1, 1933	5,301,505
Total at furnaces and Lake Erie docks Nov. 1, 1933..	36,345,473
Total Nov. 1, 1932.....	32,456,607

Philadelphia—More than 15,000 tons of North African iron ore has arrived here in two cargoes, the largest shipment in considerable time. It is reported for the account of an eastern Pennsylvania consumer, who in the fall purchased 40,000 tons.

Warehouse

Warehouse Prices, Page 52

Decline in volume of sales from steel warehouse is general, partly seasonal, As a whole November trade is not far from the scale of October and is well above that of the corresponding period last year.

In the New York district volume of sales has been gradually lessening, without sharp break. Prices for New York include delivery from Port Chester on the north to Lynbrook, on Long Island. At Boston two price schedules are being formulated, one for the metropolitan district and the other to outside points.

Detroit warehouses are feeling a moderately increased demand from tool and die shops resuming production following strike settlement. This offsets smaller demand from automotive manufacturers and November business is maintaining the October rate.

Occasional days offering increased volume of buying serves to hold November buying close to the October rate at Pittsburgh. Cleveland selling continues to decrease, though slowly. Quantity extras on galvanized sheets that have been in effect at Pittsburgh for some time have been adopted by Cleveland warehouses. The base applies on one to nine bundles, on 10 to 24 bundles 25 cents per 100 pounds is deducted and on 25 bundles and over the allowance is 50 cents.

Chicago sales are slipping slowly with the season but remain well above those of a year ago. St. Louis demand seems confined strictly to immediate requirements. Volume is larger than at the same season a year ago and general manufacturing lines are buying well.

Demand for warehouse materials at Cincinnati is showing strong resistance to seasonal influences. Some increase in sheet quotations is anticipated. Prices of other materials being steady.

Ferroalloys

Ferroalloy Prices, Page 50

Opening of books by domestic producers of spiegeleisen and ferromanganese is not contemplated for at least two weeks. Specifications have improved slightly.

Scrap

Scrap Prices, Page 51

Pittsburgh — Open-hearth scrap grades still are going begging in this district but a slight improvement is noted in grades for steel foundries. Specialties have been advanced 50 cents and are now quoted between $13.50 and $14. One foundry here purchased about 250 tons of knuckles and couplers last week, paying $13.75. This slight turn has not been viewed as significant because heavy melting steel, machine shop turnings and other tonnage items for the open hearth are weak and without takers. A small distress sale of turnings has forced that market down to a spread of $7.50 to $8 but heavy melting steel remains unchanged at $11.25 to $11.75. Effects of a tonnage sale of No. 1 steel and bundles at $11.50 and $11, respectively, to a Valley mill, are expected to bolster the local situation.

Cleveland—While some slight readjustments downward by about 25 cents have been made in the past week in various miscellaneous grades of iron and steel scrap, on the whole the market appears steady. Dealers especially seem to have continued confidence in the future of the market and are not anxious to sell.

Boston—Heavy melting steel delivered prices are again lower with $7 offered, Worcester, Mass., for No. 1. Demand for all grades of scrap is sluggish and inquiry for shipment outside this district is absent.

Philadelphia—Movement of further export tonnage of steel and iron scrap features the otherwise dull market. A shipment of No. 1 steel for Japan will leave here shortly with 5000 tons and will load an additional 4000 tons at New York. The tonnage here is going at $8.75, f.a.s. Orders are being issued for No. 2 steel for Japan at $7.50, f.a.s. The domestic market is weak.

New York—Steelworks are taking few scrap shipments and most buying is to meet export orders, new business for foreign account being complicated by the exchange situation. On limited buying, heavy breakable and No. 1 machinery cast are easier. Several other grades are lower.

Buffalo—Scrap buying has dwindled to nothing with some mills holding up shipments. Prices are nominal.

Detroit—Although iron and steel scrap quotations at Detroit remain unchanged the market continues weak and offerings have almost completely dried up. However, with the resumption of the manufacture of automobiles more scrap should come out. There is some feeling that regardless of inflation scrap prices will continue to show weakness for the remainder of the year.

Cincinnati—Quotations on iron and steel scrap are unchanged but nominal. Some strength was imparted to the market by bids on three recent railroad lists which dissipated any theory a break was imminent. Most of the material offered was sold by the Chesapeake & Ohio, Norfolk & Western and Southern.

St. Louis—Aside from the purchase by two east side smelters of approximately 2500 tons of steel, the market for iron and steel scrap continues featureless. Prices paid are understood to be the lowest in recent weeks. Purchasers specified deliveries during the remainder of this year.

Birmingham, Ala. — Demand is slow and prices are weak, though little changed. Heavy melting steel is in less demand.

Toronto, Ont.—Trading in iron and steel scrap is spotty with only special lines moving. Steel grades are dull with mills out of the market and export demand dried up. Iron grades have some call, with small tonnage lots of machinery cast moving and occasional orders appearing.

"New Deal" or "New Delusion"?

(*Continued from Page* 14)

have large reserves, and an increase in unemployment.

The law holds out some promise of an opportunity for men of an industry to get together to do some of the things which they should have had wit enough to do of their own volition. May I suggest, however, that during the past few years we have learned that, while it's quite possible to convince a man that the excessive use of alcoholic liquor is unwise, it's impossible, by passing a law, to make him a teetotaler.

There is no mystery about the

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constant increase in the threats which have emanated from Washington relative to the enforcement of NIRA and the codes. These threats will inevitably increase for once started on a system of national control there can be no stopping until that control is absolute and all-embracing, and every detail of our lives is regulated from without.

What is the basis of this revolutionary action? I do not for one moment question their motives or their honesty; but I do question the truth of their premises and the logic of their conclusions. They are obsessed by two hallucinations: First, that government can (perhaps with their help) plan and regulate and dictate the lives and work of 125 million people, better than those same people can plan their own lives; and, second, that industry, under the capitalistic system, the system of free initiative, has not produced as much for the common people as this other system might have done. They constantly compare the existing conditions with those existing in 1917, and insist that inasmuch as the federal government took charge then, it should do so now.

Whence comes this idea that in 1917 and 1918 the federal government broke the all-time record for industrial efficiency? You, yourselves, went through that period. Is this the picture which is still carried by your subconscious minds?

With Europe aflame for two and a half years before that fitful February day when relations were broken off, were you impressed by the plans which had been worked out by the administration, and by the government-controlled army and navy, to cope with this eventuality? Do you remember the blueprints they hadn't made, clothing they didn't have, ships that weren't ready?

Do you recollect that the American army, wonderful as it was, was forced to fight the war with foreign arms and foreign ammunition? Do you remember the countless days and nights you spent in Washington trying to get an answer to some trifling question to enable you to go ahead with your production?

What was your recollection of the government-operated railways? Were they more efficient or less efficient than the private-operated roads have proved since then, burdened though they have been by regulations? Do all these things proclaim the fact that government can operate industry better than can individuals?

What about the unbalanced budget, and constantly increasing deficit of the national treasury, the mounting debts of our states and cities and our counties, with their defaulted principal and interest, their unpaid firemen and policemen and school teachers, and their overpaid political officials? Do these point the way to a more efficiently operated industry?

The actions necessary to produce a profit in industry are often exactly opposite to the actions necessary to get the largest number of votes. The solution is not to reform politics, which is the oldest science in human society, *but rather to refuse longer to turn over to it problems which must be solved on business principles*, which problems politics is fundamentally incapable of solving.

The capitalistic system is not perfect, any more than nature is perfect, or any human being is perfect. But it is the best system yet devised, and its shortcomings are infinitely less than those produced by the socialistic philosophy.

No people in the world's history have shown such progress. No nation has come sufficiently close to even form a comparison. Yet, in this one field where she clearly, definitely, and admittedly outshines all competitors, we are challenged as being failures.

This despised and derided system has given to this country, even after these years of depression, 76 million life insurance policies and savings accounts, totaling 92 billion dollars, one-third of the railroad mileage of the world, 73 per cent of the motors, 58 per cent of the telephones, 32 per cent of the coal produced, 62 per cent of the petroleum pumped, 35 per cent of the copper mined, 34 per cent of the pig iron and 37 per cent of the steel produced.

In proportion to her population, she possesses more public schools, more institutions of higher learning, more libraries, more hospitals, more free clinics, more asiyums and institutions for the defective, publishes more newspapers, periodicals and books, has more and better music and theaters and movies than any nation on the earth. Her people possess more radios, more electric lights, more electric irons and washing machines, more heated homes, more bathrooms, more running water, more of every one of the things which make for ease of life and freedom from drudgery than those of any other nation. If a system, which in a few short years has produced all these things, is a failure, will you tell me what in Heaven's name would be necessary to make of it a success.

Those who miscall themselves liberal, but who are actually leading us away from liberty, tell us that we have passed through a great revolution. I think they are a bit optimistic; for I find no record that the people of this country, who, thank God, still rule, have voted either for socialism or revolution.

If the Congress which meets in January leaves these laws unchanged, if the people at the election a year hence return those same men to office, then we shall have gone through the greatest revolution of all history, and, in the space of a few months, shall have retrod all the steps of progress taken by the English-speaking race since that far-off day seven centuries ago when Englishmen forced the Great Charter from King John.

Wake up, you men of America, before it is too late. This country of yours faces the greatest crisis since the Pilgrims landed on its shores. What are *you* going to do about it?

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Metals

Nonferrous Metal Prices, Page 50, 51

New York—Uncertainty continued to pervade the nonferrous metal market last week. Principal metals failed to rise in response to the government's program to lift commodity levels.

Copper—Electrolytic metal was quoted through the week at 8.25c, Connecticut. Light sales at this level were made for delivery through first quarter of 1934. Reports of shading could not be substantiated but some resale metal went at 8.00c. Fair sales of lake metal were made. Domestic stocks dropped 8000 tons in October to 520,000 tons. Negotiations in progress on the copper code reached conclusion. Brass ingot was cut ¼-cent.

Lead—Battery makers were the chief buyers but business in all directions was light, being principally in carlots. The market continued to maintain a firm appearance.

Zinc—Fair business was understood to have been done quietly at 4.50c, East St. Louis. Prices were steady.

Tin—Prices shot up rapidly on further depreciation of the dollar in terms of sterling. At one time prices as high as 57.00c were named. Prices eased somewhat late in the week.

Antimony—A stronger Chinese market resulted in a slight rise here. Sales lagged.

Aluminum—Business was slow but prices held fairly well.

Coke By-Products

Coke By-Product Prices, Page 49

New York—Slowing in demand for distillates is limited largely to toluol, lacquermakers taking less. Production, however, has declined. Benzol buying holds well. No change in prices of distillates is expected for the first half of 1934, and distributors are offering to cover moderately on first half needs.

Quicksilver

New York—Quicksilver is holding nominally unchanged, with round lots $66 to $67, a virgin flask of 76 pounds, and small lots 50 cents higher. Domestic supplies are still restricted.

All the Uniform Extras and Deductions for Products of the Iron and Steel Industry Under the Code of Fair Competition Approved by the Board of Directors of the American Iron and Steel Institute, September 20, 1933.

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Pacific Coast

Pacific Coast Prices, Page 49, 50, 52

San Francisco—(*By Air Mail*)—Structural steel and reinforcing bar markets are the most active, government and state projects continuing to furnish business. The largest award involved 9000 tons of shapes for approaches to the Golden Gate bridge, placed with the Columbia Steel Co. However, Judson-Pacific Co. will fabricate half of the project.

Prices are firm with shapes and plates 2.25c, and merchant bars 2.30c, f.o.b. cars, dock, Pacific ports.

Awards of reinforcing bars in the week were the heaviest in over a month and aggregated 1350 tons. Soule Steel Co. secured 721 tons for buildings at Hamilton Field, Calif., and Pacific Coast Steel Corp. took 135 tons for the same project. Unnamed interests booked 105 tons for Boulder dam. The pier, quay walls and repair basin at Pearl Harbor, T. H., up for figures Nov. 15, will require 6500 tons. Bids have been opened on 1000 tons for hangars at Hamilton Field. Pending business now exceeds 14,500 tons.

Plate demand has improved, although awards were not heavy. San Francisco has voted bonds for $12,095,000 for additions to the Hetch Hetchy project, including over 17,000 tons of plates for pipe lines. Los Angeles opened bids Nov. 14 for 2500 tons for tunnel liner plates.

Structural shape lettings were the largest for any week since the first of August and totaled 10,367 tons. McClintic-Marshall Corp., Bethlehem, Pa., secured 458 tons for the Soto street bridge, Los Angeles. Bids have been opened on 4000 tons for the federal building at San Francisco, on 3100 tons of trash racks for Boulder dam and on 2700 tons for hangars at Hamilton Field, Calif.

Few inquiries of importance are noted for cast iron pipe. Makers are interested in a lot of 30,000 tons for San Francisco, on which the city voted bonds Nov. 7. It is expected that bids will be called soon. United States Pipe & Foundry Co. took 1609 tons for Long Beach, Calif., National Cast Iron Pipe Co. booked 250 tons for Hamilton Field and American Cast Iron Pipe Co. secured 110 tons for Beverly Hills, Calif.

Awards in Fair Volume

Seattle—Awards this week included 100 tons of 16-inch monocast pipe for the Twenty-sixth street water main extension at Tacoma, Wash., to American Cast Iron Pipe Co., Birmingham, Ala. Cashmere and Chewalah, Wash., have opened bids for small tonnages of 6-inch cast iron pipe.

Bethlehem Steel Corp. is understood to have the contract for 600 tons of plates and 250 tons of shapes for a motorship to be built by the Lake Washington Shipyards, Seattle, for Northland Transportation Co. No steel award is announced for the three coast guard cutters for which Lake Union Dry Dock & Machine Co., Seattle, has the contract. Requirements will approximate 450 tons of plates and shapes. The state will receive bids Nov. 28 for an undercrossing at Spokane, Wash., involving 364 tons of shapes and 45 tons of reinforcing bars and steel castings.

The jobbing trade is slightly improved but little is expected during the coming 60 days. Buying is general out of stock with sheets and bars in fair demand and light plates moving more slowly. Jobbing prices are unchanged and are being maintained although in the Portland district there is a disposition to request adjustments.

Local steel mills, on short operations, are out of the scrap market.

Good melting scrap is rather firm, Oriental interests offering $7 to $7.50, f.a.s., gross ton. Some recent sales have been concluded, one lot of 4000 tons being offered for prompt shipment.

Steel in Europe

Foreign Steel Prices, Page 52

London—(*By Cable*)—Enlarged volume of business in steel and iron in October is reflected in statistics just released. Exports increased from 157,400 tons in September to 193,613 tons in October, a gain of 36,213 tons; imports grew from 80,300 tons in September to 88,854 tons in October; pig iron output gained 13,600 tons, from 359,700 tons in September to 373,300 tons in October; steel production made the only loss, 700 tons, from 669,000 tons in September to 668,300 in October.

Two furnaces have been blown in by Middlesbrough works and both home and export business in that area is increasing. Denmark and Italy are buying hematite stocks. Some decreased activity is met in finished steel but increasing overseas orders for rails are being booked. In the Midlands trade is active except in heavy products. Scottish trade is quiet. Tin plate is in demand and the outlook is good. Exports of galvanized sheets are quiet.

The Continent reports more activity in export markets since the increase of prices by the steel cartel, especially to China. The nearest competition in South American markets is from Japan.

Equipment

American Bridge Co., Pittsburgh, has placed an order for four special drilling machines, involving about $25,000. Beyond this, buying of machine tools and mill equipment continues dull. A Youngstown, O., mill has suspended shipments on all mill equipment previously placed.

A truck builder in the Cleveland district has purchased $125,000 worth of machine tool equipment, in connection with production of a new truck model. Boring, milling and drilling machines are included.

The Dodge division of Chrysler Corp. is reported to have contracted for a considerable volume of foundry equipment, including molding machines, core machines and sand handling and preparing equipment.

A boring mill builder in New England recently booked several large units and some business for the navy department yards is aiding shops in that district. Textile mill equipment builders have business booked for high operations well into the first quarter.

Reports from Chicago indicate the equipment market is more active, important inquiries from the government for Pacific coast navy yards being figured. Inquiry for 15 tools has been received from the Chicago, Milwaukee, St. Paul & Pacific railroad. Four tractor manufacturers in the Chicago district will furnish 146 of 172 units ordered for the civilian conservation corps, contracts amounting to $435,318.

Semifinished Steel

Semifinished Prices, Page 49

First quarter prices on sheet bars, billets and slabs are expected to be announced Nov. 20. Late last week the general expectation in the trade was that the Pittsburgh base of $26 on sheet bars, billets and slabs would be continued. An advance in wire rods likely will be made for the first quarter with the Nov. 20 filing date. No change is expected in alloy billets.

Here and There In Industry

RACINE TOOL & MACHINE CO., Racine, Wis., has shipped three of its newly improved hydraulic production metal-cutting saws to Vatican City, Rome. The order was obtained through the company's Italian representative, Societa Anonima Emanuele Mascherpa, Milan, Italy, in the face of strong competition from American and European manufacturers.

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International Selling Corp., 70 Pine street, New York, has been appointed agent for the sale of Ouenze ore, an Algerian low phosphorus ore. W. F. Brazeau is in charge.

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Mid-West Foundry Mfg. Co., Michigan City, Ind., has completed its new plant and is installing equipment. Production will be started soon. Louis Frehse and Thomas Bies are owners.

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Graver Tank & Mfg. Corp., East Chicago, Ind., has taken over part of the facilities of the Phoenix Mfg. Co. at Catasauqua, Pa., to be used in the fabrication of brewery tanks and other plate products.

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Fisher Governor Co., Marshalltown, Iowa, has appointed Smith Separator Co., Tulsa, Okla., its distributor in Oklahoma and north Texas for its line of pressure and recording instruments.

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Theodore L. Dodd & Co., 80 East Jackson boulevard, Chicago, have been appointed western sales representatives of A. H. Wells & Co. Inc., Waterbury, Conn., manufacturer of seamless brass, copper and bronze tubing.

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American Bent Steel Co., New York, recently organized, has taken a five-year lease from the Gilford Mfg. Co., Buffalo, on a factory on Thirty-seventh street, north of Forty-third avenue, Long Island City, N. Y.

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South Bend Tool & Die Co., South Bend, Ind., finds its sales and production at the highest point in several years. The plant is being operated three shifts with 175 men, five times the force employed a year ago. James R. Huckins is manager.

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MacWhyte Co., Kenosha, Wis., has taken two government contracts for supplying ⅜-inch galvanized strand wire to a total of 411,000 feet for use in developing the 6-foot channel in the middle Missouri river. The cable goes to Kansas City, Mo., and St. Louis United States engineers' offices.

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Waukesha Motor Co., Waukesha, Wis., has established a mid-continent sales and distributing division at 313 East Second street, Tulsa, Okla., in charge of Arch F. Campbell, to serve Kansas, Oklahoma, Texas, Arkansas, Louisiana and New Mexico.

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Kron Co., Bridgeport, Conn., manufacturer of automatic industrial scales, has appointed the following as distributors: D. W. Lawler, 1911 Rutherford avenue, Louisville, Ky.; L. G. Hardin, box 271, Alexandria, La.; W. B. McCauley, 15 West Franklin street, Baltimore.

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Inland Steel Co., Chicago, has opened a sales office at 1511 Kirby building, Dallas, Tex., to handle sales in Texas, except the city of El Paso, and in the city of Shreveport, La. F. B. McKinney will be district sales manager, in charge of the office.

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National Cable Co., Portland, Oreg., recently organized, is building a plant to manufacture a noncorroding cable attachment for storage batteries. Production was started about Nov. 15. H. J. Rich, formerly of Duluth, is president and C. R. Gross vice president.

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Kennedy-Van Saun Mfg. & Engineering Corp., New York, and Danville Iron & Steel Co., Danville, Pa., have been merged. The Danville company manufactures large stone crushers and pulverizers and has orders sufficient to keep the plant busy until February.

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General Foundries Co., 1545 South Barclay street, Milwaukee, established 18 months ago, is adding to its plant to increase melt from seven to 13 tons per day. Five additional molding machines have been installed and a dust-handling system added. D. A. Lucas and F. W. Busche are owners.

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Massey-Harris Ltd., Toronto, Ont., manufacturer of agricultural implements, has made arrangements with Blackstone & Co. Ltd., Stamford, Eng., by which the latter will market the former's farm implements in Great Britain. The company has maintained offices in Manchester and London, Eng., for some years.

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Illinois Barge Line Co. has been formed with offices in the First National Bank building, Chicago, to operate a barge line over the recently completed Illinois waterway and Mississippi river. Service will be concentrated on the route between Chicago and St. Louis. The company is expected to order eight barges shortly.

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Allis-Chalmers Mfg. Co., Milwaukee, has issued a number of licenses to manufacture on a royalty basis its multiple V-belt drives, designed and developed by Walter Geist, general representative in charge of the belt drive division. The licensed manufacturers have organized as the Multiple V-Belt Drive association with Mr. Geist as president.

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Dominion Steel & Coal Corp., Sydney, N. S., has received orders from England for 1200 tons of nails and from South Africa for 200 tons of iron bars and 200 tons of barbed wire. The nail order was the second from England within three months. The present working force of 1700 probably will be kept employed until after the beginning of 1934.

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Harnischfeger Corp., Milwaukee, has shipped a 350-ton double-trolley electric traveling crane to the new municipal hydroelectric generating plant at Seattle. It is of all-welded frame construction, weighs almost 200 tons and required six flatcars for shipment. The crane was completed in February, 1931, and awaited shipment until the plant was ready to allow installation.

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Kennard-Rafkin Machinery Corp., 224 Culver avenue, Jersey City, N. J., recently organized with E. T. Kennard president, will engage in the sale of machinery. It is equipped to buy and liquidate entire plants. Mr. Kennard formerly was president of the New York Machinery Exchange and M. M. Rafkin, treasurer, formerly was president of the American Machinery Exchange, both of New York.

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Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., is resuming the fabrication and sale of concrete reinforcing bars after several years inactivity in this line, and has added a modern fabricating shop with staff of reinforcement engineers. Charles C. Steel, recently resigned as vice president and general manager of sales for Sweet's Steel Co., Williamsport, Pa., is sales manager of this department.

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Harnischfeger Corp., Milwaukee, recently was host to the Milwaukee chapter, American Society of Industrial Engineers, the first of a new series of plant dinner and factory inspection meetings. Arc welding practice was shown in slides and motion pictures explained by Klaus L. Hansen, chief engineer of the P. & H.-Hansen arc welder division. A trip through the plant showed actual operation of a fleet of welders.

Construction and Enterprise

New York

BALDWINSVILLE, N. Y.—Village has approved plans for a sewerage system to cost $125,000.

New Jersey

NEWARK, N. J.—Stirrup Metal Products Corp. has been incorporated to manufacture metal products, with $25,000 capital, by Fred Herrigel Jr., 1060 Broad street, Newark, N. J., agent.

Ohio

IRONTON, O.—Ironton By-Product Coke Co. Inc., 61 Broadway, New York, has asked federal permission to construct improvements at its plant on the Ohio river at Ironton, including a dock, conveyor system for coal and coke and steel towers for the belt conveying system.

Michigan

CASSOPOLIS, MICH.—C. W. Cole, engineer, South Bend, Ind., has completed preliminary plans for a $60,000 sewage disposal plant and a $20,000 water system at Cassopolis, Mich.

DETROIT—Hydraulic Classifier & Concentrator Corp. has been incorporated with 200,000 shares no par value to manufacture appliances for classification of minerals, by Norman J. Urquhart, 25 East Bethune avenue, Detroit.

DETROIT—Reserve Specialty Mfg. Corp., Transportation building, has been incorporated with 50,000 shares no par value to carry on a specialty manufacturing business, by H. C. Kimmy, 1930 Mahoning avenue, Warren, O.

Indiana

HAMMOND, IND.—Factory Sales Co. Inc. has been incorporated with $5000 capital to manufacture refrigerators and store fixtures, by George O. Hagen, Paul T. Marieau and associates.

INDIANAPOLIS — Superior Trailer Mfg. Co., Harry Faber, general manager, a newly formed company, which recently took over the Broeckel Body Co., has leased the entire plant formerly occupied by the Weideley Motors. Equipment for the manufacture of semi-trailers and truck and trailer bodies has been installed.

MUNCIE, IND.—Werts Novelty Co. Inc., 930 South Pershing drive, has been incorporated with $15,000 capital to manufacture machinery and other devices suitable for games and amusements, by Fred W. Werts, Otis M. Jacobs and associates.

RICHMOND, IND.—Midwest Mfg. Corp., Eighth and F streets, has been incorporated with $15,000 capital to manufacture plumbing and heating equipment, by James C. Doyle, Alvin J. Weckler and Joseph Skriba. The company will establish its manufacturing operations in the plant of the Reliance Foundry Co.

Illinois

CHICAGO—Municipal Engineering & Equipment Co., 228 North LaSalle street, room 917, has been incorporated with 200 shares capital stock to carry on a foundry and machine shop business, by Joseph F. Charash, correspondent, 228 North LaSalle street, Chicago.

CHICAGO—Lindbloom Valve Packing Co., 4026 West Lake street, has been incorporated with 100 shares capital stock to manufacture valve packing, automotive, aeronautical and marine engine parts and accessories, by Hecker Marine Works, 4026 West Lake street, Chicago.

CHICAGO—Plonsker Engineering Co., 39 South Jefferson street, has been incorporated with 150 shares capital stock to manufacture refrigeration, heating, air conditioning and power plants, by Wolfsohn & Foreman, 806 Westminster building, 110 South Dearborn street, Chicago.

Missouri

KANSAS CITY, MO.—Captain Theodore Wyman Jr., United States engineer's office, 707 Postal Telegraph building, Kansas City, Mo., will receive bids until Nov. 29 for preparing right-of-way, placing culverts and incidental work for about 14 miles of single-track railroad, with Y and sidetrack of about 10,000 feet at Wiota, Mont., from tracks of Great Northern to Fort Peck dam site.

Oklahoma

OKLAHOMA CITY, OKLA.—Miller Spring Co. has been incorporated with $25,000 capital to manufacture springs, by Austin Miller, 1121 East Grand avenue, Oklahoma City, president.

PICHER, OKLA.—S. S. & C. Mining Co. has been incorporated with $12,000 capital to operate lead and zinc mines, by G. L. Childress, Joplin, Mo., president.

TULSA, OKLA.—Oklahoma Union Salvage Co. has been incorporated with $25,000 capital to salvage the properties of the Oklahoma Union Railway Co., formerly operating an interurban line from Tulsa to Sapulpa, Okla., recently sold at receiver's sale. Felix Bodovitz, 211 West Fourth street, Tulsa, Okla., is attorney.

Wisconsin

EDGERTON, WIS.—Nunn, Bush & Weldon Shoe Co., 2822 North Palmer street, Milwaukee, has plans by Frank F. Drolshagen, architect, 647 West Virginia street, Milwaukee, for a branch plant, including power plant, at Edgerton, Wis., to cost about $100,000.

DENMARK, WIS.—Denmark Brewing Co., recently incorporated with $50,000 capital, has started construction of a plant to be in production by Jan. 1, to cost $40,000 for the first units. Gilbert Sundstrom, Frank X. Warm and Edward Pelishek, all of Denmark, Wis., are the incorporators.

GREEN BAY, WIS.—Fort Howard Paper Co. has let contracts for an addition 30 x 60 feet to its power plant.

GREEN BAY, WIS.—Norcor Co. has been incorporated with $25,000 capital to deal in iron, steel and tin metal products, by W. J. Giese, F. Cats and E. Schultz.

MANITOWOC, WIS.—Curt G. Loa, on the engineering staff of the Invincible Metal Furniture Co., Manitowoc, Wis., is planning to establish a shop for manufacture of a new machine of his design for manufacturing highly specialized paper products, for which he has patents. Several machines for export have been built.

MANITOWOC, WIS.—Aluminum Specialty Co., which recently took over the equipment and business of Metal Goods Corp., St. Louis, is building a 1-story fireproof addition, 40 x 60 feet, to add to its tool and die production and storage facilities.

Pacific Coast

ALHAMBRA, CALIF. — Southwest Welding Co., 3201 West Mission street, will build steel frame addition to its factory with corrugated roof and sides.

HANFORD, CALIF.—L. B. Dapron, 232 East Seventh street, plans to build a plant costing $125,000 on Dudley Ridge road for the manufacture of carbon black and other gas products.

HEALDSBURG, CALIF. — Geysers Development Co., 217 South Hill street, Los Angeles, R. E. Bering, president, will build an electric power plant to supply the city, including two 1000-kilovolt-ampere turbo, generator units, driven by low-speed multicylinder heavy-duty gasoline engine, and three-phase, 60-cycle, 2400-volt, 100-kilovolt, ampere generator.

STOCKTON, CALIF.—Santa Cruz Portland Cement Co., Crocker building, San Francisco, plans erection of a cement plant to cost $100,000. George T. Cameron is president.

BONNEVILLE, OREG. — Public works administration has allocated $20,000,000 for construction of a dam and six power units at Bonneville, Oreg., on the Columbia river.

PORTLAND, OREG.—National Cable Co. has been incorporated and is building a factory at 1339 N. E. Burnside street to manufacture a noncorroding attachment for storage batteries, production to start about Nov. 15. H. J. Rich is president.

SEATTLE—Puget Sound Sheet Metal Co. has taken a contract to furnish storage and powerhouse equipment for the Sunset Mercantile Co., Wallace, Idaho.

Dominion of Canada

POINT ROUGE, QUE. — National Foundry Works lost a portion of its works by fire recently.